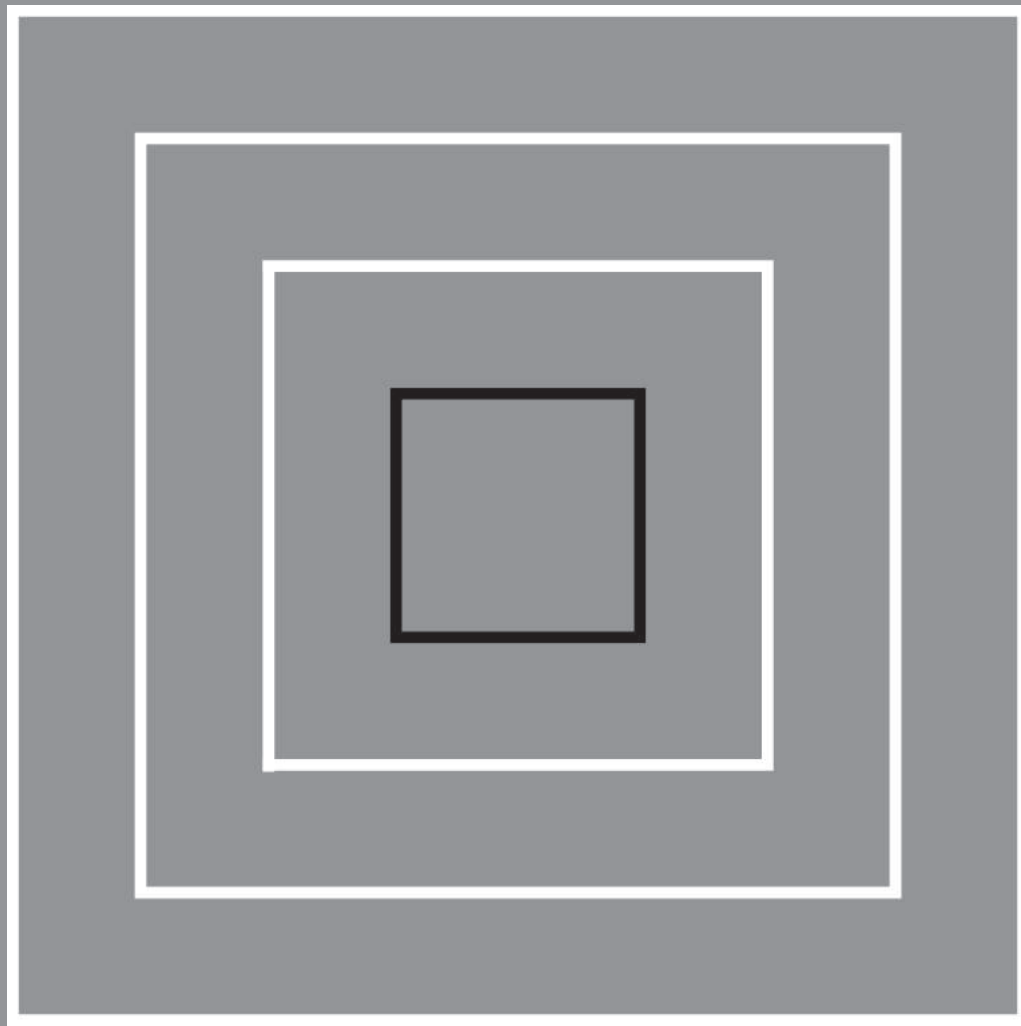


DESIGN STUDY





G DESIGN STUDY

As an inquiry into possibilities of a given context (site and programmatic desiderata) designing does not call for methodological requirements, but rather for liberation from down-trodden problem definitions and their solutions.

Creating space of thought

Hertzberger explores the methods assisting in opening up the possibilities, instead of determining them. Descartes' *'Discours de la Méthode'* focused on doubt. Design study distrusts, like classical sciences, all that is obvious, but does not throw everything overboard all at once. Experience evaporated into routine deserves suspicion of the scientific approach, deeming no pre-supposition sacred. However a culture, certainly a local one, surrounds us with pre-suppositions unbeknown to us; like a fish without knowledge of the water it is taken from, at the same time there is certitude of existing conditions: a table, a bed, a kitchen entails great forms of freedom.

Perceiving and conceiving

Because of this Hertzberger then appreciates greatly collecting architectural examples, references. However, awareness of these references requires a technique of reduction if they are to be used in a different context from the old one, and not at their beck and call.

Formation of the image

De Jong and Rosemann survey notions on the formation of images from scholarship, science, philosophy and the arts. Where do we cross the threshold from pure experience into making? Starting point is development psychology but the end is design.

Experience, intuition and conception

Geuze, Van Eldijk and Van Kan show the design process of a gifted student from analysis of the location until the final design with all its pitfalls and dead ends.

Designing an office

Brouwer, Van Eldijk and Van Kan then show a design process of an experienced architect directly starting with a concept, the influence of context, metaphores and fixing sizes

Designing a village

At last, Heeling, Van Eldijk and Van Kan describe the more formal design process of an experienced urban designer with a more global frame and grain.

Urban design methods

Enlarging frame and grain limits applicable methods, but, Westrik discusses so many methods in this field, that we can conclude that there are more methods than designers.

Designing in a determined context

Finally de Jong allocates them within the communicative maze of the building team.

Conclusion

There are more design methods than designers. Nevertheless, we recognise something in every design process. Though we can not name or systemise all phases, we can learn from it.

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42 CREATING SPACE OF THOUGHT

HERMAN HERTZBERGER

Too often we find the creative process of the architect depicted as a succession of flashes of inspiration which the privileged evidently receive as a gift and others wait for in vain, as though ideas are some kind of thunderbolt from on high. When you see architects continually out to trump one another with new ideas, you end up wondering at times just where the hell they get them all from!

That architects have to think primarily in forms is rooted in a mis-understanding. In the first place, they must have an idea of the situations as these affect people and organisations, and how situations work. From there concepts emerge: that is, ideas regarding these situations take shape. Only then does the architect envisage forms in which all the above might be cast. Surprising architectural responses are invariably the ultimate formulation of the results of a thought process. They did not appear out of thin air, as gifts from the gods for the particularly talented!

Architects, including the seriously gifted, construct their ideas, even if these are keys to utterly new insights, out of raw material that in one way or another had already to be present in their minds. Nothing, after all, can be born of nothing.

Designing is a complex thought process of potentials and restrictions out of which ideas are born along fairly systematic lines.

New responses issue from combinations and quantities other than those we already knew. We do things with what we have in our minds, and more cannot come out of them than went in. All neuro-psychological explanations notwithstanding it works the same as it does for the cook who can only use what he has in his kitchen when putting his meals together. Ignoring the fact that a good cook can do much more with his ingredients than a less gifted colleague, in both cases the point is to fill the pantry with as many ingredients as possible so as to have richer combinations, and thus, a wider range of possibilities at their disposal.

The ingredients the architect can draw from are the experiences he has had throughout the years, and which he can directly or indirectly relate to his profession. Considering that the range of his discipline is infinitely broad and is literally about everything, that means quite a host of experiences! So, it is important for the architect that he has seen and heard a lot in his life, and anything he did not experience first-hand he has a pretty good idea of, that is, he must empathise with every situation he has come across.

42.1 INGENUITY, CREATIVITY

A culture where conditions and values shift all too easily requires an unremittingly critical attitude towards out-moded concepts (and naturally towards new potentials too). In literally every situation you have to keep asking yourself whether the familiar path is still the most effective, adequate and/or advisable choice or that we are threatening to become victims of the daily routine and the straitjacket of existing clichés. Each design decision it seems, each choice we make, needs sounding out every time against changing criteria, but all too often inevitably calling for new concepts. This is why we need ingenuity and what we usually term creativity.

Put briefly, the beginning of the design process could boil down to the following: first, there is a task, clearly couched or making a first vague appearance. You are after an idea that will give you a concept you can use to further elaborate the design. Looking around you and drawing from your memory where the ideas you once thought interesting are stored, you head off in search of analogies that might well yield an idea. Though identifiable as missing

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* This text is based on: Hertzberger, H. (2000) *Space and the architect: lessons in architecture 2*. Originally published in Dutch: Hertzberger, H. (1999) *De ruimte van de architect: lessen in architectuur 2*. © 2000 Herman Hertzberger / 010 Publishers, Rotterdam. Translated from the Dutch by John Kirkpatrick.

pieces of your jigsaw puzzle, these links are all too often transformed - disguised, in other words. The art then is, of course, to see through those disguises. We can assume that each new idea and new concept must be a transformation or interpretation, respectively, of something else, further developed and brought up to date.

There is no way of finding out how the idea came to you; was it there already, was it generated by old images or only strengthened, confirmed? This is a complex inter-action of suspecting, seeking and recognising, in the way where question and answer vie for primacy.

42.2 ERASING AND DEMOLISHING OLD CLICHÉS

To find new concepts as an answer to new challenges you first have to unmask the existing clichés. This means stripping the mainsprings of the programme underlying the architecture of the routine that has seeped into them by breaking open the programme and opening it up to new arguments. Whenever a programme is judged critically it transpires each time that it has lost much of its validity. This is why we must shift emphases and shake off ingrained habits. This is easier said than done. The issue is to demolish existing clichés.

A great deal has been written about creativity and how it might be acquired, invariably pointing out the importance of forging links with other things entirely. However, it is stressed far too infrequently that the difficulty of finding the new is mainly that of shaking off the old. Room for new ideas has to be conquered by erasing old ideas engraved in our minds. If only one could keep beginning with a clean slate, approaching each task as an unknown quantity, a new question that has yet to be answered. Unfortunately, this is not the way our brains work. Associations well up immediately, whether you want them to or not, major and minor skills nurtured by experience and developed by professional expertise, tried and trusted recipes that stand there in the way of genuinely new ideas.



391 Robert Delaunay *Eiffel Tower*, 1913

Ingenuity in finding new concepts is all too often seen as something exclusive, reserved for the few who are gifted in that respect. When the prime concern is indeed the ability to shake off existing clichés and face the task each time as an unknown quantity, the problem is mainly a psychological barrier that is going to need some demolishing.

If the old, well-known, part belongs to our familiar world, the new is basically a threat. Whether it can become absorbed, and, therefore, accepted depends on the associations it evokes and whether these are regarded as positive, or at least not as negative.

A child, then, may see a flash of lightning, whose dangers we know and to which we feel a certain ingrained fear, as a kind of firework with all the feelings of gaiety that brings. *“All I have done throughout my life is to try to be just as open-minded as I was in my youth - though then I didn’t have to try.”*

When plans emerged to keep the Eiffel Tower after all - it had originally been intended to be temporary - a storm of protest blew up, most of all among intellectuals who saw the city disfigured with a monster culled from the hated world of industry. And that when in the very latest generation there was almost no-one to be found who was not inspired by it as a presage of a new world.

Whether you like a thing or not depends on the affection you feel for it. This is not only something you have or acquire later, you must have had it to begin with to have liked the thing in the first place; affection is as much a condition as a consequence.

42.3 THE EAMES HOUSE BREAKING THE CLICHÉ

The story goes that in 1946, when Charles and Ray Eames decided to build themselves a house and studio, they were forced to restrict themselves to steel beams and columns standardised for assembly plants and obtainable from a firm of structural engineers, as material was scarce so soon after the war. And if this were indeed true, you might wonder if they really felt restricted by the thus imposed reduction of their house to a pair of box-shaped

factory sheds, which they placed on the highest part of their eucalyptus-strewn site in a line along the property boundary.

These industrial designers, constantly alert as they were to everything that was new and potentially reproducible in series, sounding them out and absorbing them into their world, clearly saw this as a challenge. Typically, rather than feeling limited by having only those means at their disposal that industry allowed at the time, they were inspired by the possibilities this situation brought.

And so it was that the factory shed was transformed into a house with a form unknown before then. The point is that they saw the opportunity to look beyond the factory-building forms such as the prominent open-web steel joists and suppress those associations with others closer to the domestic ambience. Charles and Ray Eames succeeded in erasing the factory element by means of simple yet marvellous elevations, likewise composed of standard elements, with areas of colour and, on the inside, sliding light-absorbent panels, the effect being as much Japanese as Mondrianesque. Again, the tiled paths and planting right up against the elevations betray the sort of care that regrettably one only expects to find in dwelling-houses.

The basic, even bare, container aspect of the building is equalled only by the opulence of its infill and contents. This consists of an endless and varied collection of objects and artefacts from all over the world, brought back by the Eameses from their travels - fascinated as they were by everything made by human hand the world over in a never-ending diversity. And what better accommodation for all these items collected by those irrepressible souls than these pre-fabricated containers. These lent themselves perfectly to being coloured in and indeed to becoming part of the collection.

When Ray Eames laid the table for her guests, it was not with the obligatory tea or dinner service of so many pieces and accessories to match, but according to quite another principle. She went through the abundant collection of plates and cups-and-saucers, finding for each guest a set deriving from differing services, but combined to meet other criteria - a beautifully conceived combination of pieces chosen to match their user.

The familiar image of a table laid homogeneously yielded to a gay miscellany of colours and shapes, like a miniature '*musée imaginaire*', of a new homogeneity, be it more complex and full of surprises.

Two arrangements, two paradigms, both with their attendant associations.

The so-many-piece table service stands for comfortable circumstances and ancient descent, for such services get passed down from generation to generation and only in the hands of an old and established, culturally developed family do they survive through the years unchipped and generally unscathed. Combinations of table services that are brought together from here, there and everywhere rather than comprising a set, are the province of the less well-to-do who can afford less and cannot boast an illustrious past.

The infinitely varied collection of Ray and Charles Eames represents the cultural élite of the small group that expresses its passion for exploring the world, with its great diversity of cultures and customs, in a collection as precious in its heterogeneity as the family table service is in its homogeneity. Once the question of what you can or cannot afford has been dispensed with, respect for the past acquires another value and another form.

This example shows that old values, however interesting historically these are, are all too easily clung to against one's better judgement; and that suppressing and replacing such pre-conceptions creates new space, new room to move.

42.4 JEAN NOUVEL BREAKING THE CLICHÉ

These two all-metal blocks, set at right angles to a provincial feeder road to the city like some means of conveyance - more bus or train than ship - amidst a development that is more rural than urban, sit surprisingly well in their context. This is because we have become oblivious to the metal boxes of every imaginable shape and size setting the scene in increasing numbers



392 Charles and Ray Eames, *Eames House* (Los Angeles, 1946)



393 Jean Nouvel; Jean-Marc Ibos, *Nemausus Housing* (Nîmes, France, 1987)



394 Doormats



395 Marcel Duchamps, *Fontaine*, 1917

a Arman, Y. (1984) *Marcel Duchamps plays and wins / joue et gagne*.

throughout our cities and landscapes. But, it is certainly also because of the magnificent way these two lock in from either side of a strip of gravelled parkway flanked by plane trees as if they had always been there. The *allée* of slender planes continues to dominate the picture, visible from all sides as the housing blocks ‘hover’ on posts that are more slender still. Here Le Corbusier’s *pilotis* principle is applied so convincingly *après la lettre* that one cannot help but be converted.

Other than in the *Unité* whose heavy columns all but blocking the view generated an inhospitable no man’s land, these buildings stand on stilts in scooped-out, and, therefore, sunken, parking strips so that the parked cars do nothing to obstruct the view through.

Apart from the eye-level transparency on the ground plane this response is also a brilliant natural solution for the problem of parking which, although not new in itself, is here as open as it is objective through the minimal and simple response without balustrading or concealing walls to block the view.

This project also stands out in that everything is done to provide a maximum of space. Its access galleries are as broad as station platforms from which you enter your home with as little fuss as possible, much like entering a subway train, efficiently, but anonymously. Only the doormats identify the entrances as front doors and these ultimately are more image-defining even than the loud-and-clear graphics consistently derived from the world of transportation and including the numbering of the apartments.

The balconies have perforated forward-tilting sheet-steel spandrel panels which give the building its unmistakable, elegant, appearance, but behind which an utterly different and more varied character emerges through personal use. Each component has a certain overmeasure seldom encountered in housing, which may be why it gives off such a strong sense of space. The inhabitants respond with an almost un-French eagerness with additions of their own. Perhaps it was the restrictions imposed out of considerations of architectural purity - such as the architect’s ban on adding to the crude concrete walls worked by an artist, and the metal grid landings between bedroom and bathroom - that in a presumably unintentional paradox were the very reason why tenants responded with all kinds of crazy modifications. These additions are nowhere to be found in articles about the building, yet it is these that best illustrate the space opened up by that construction.

42.5 CHANGE OF CONTEXT

Looking at the task before you in another light is the same as looking at another task, and for that you need other eyes. The problem is that everyone is constantly searching for recognisable patterns that are interpreted as rapidly as possible, in other words, that gain a place in our familiar world.

And the more familiar our world, the way we have built it piece by piece, the more trusted insights we have at our disposal and the more difficult it is to avoid them.

Inventiveness is in inverse proportion to knowledge and experience. Knowledge and experience keep forcing us back into the old grooves of the old record of meanings, the way a knife keeps returning to the original striations in a sheet of cardboard. Finding new concepts would not be difficult if only it were easier to shake off the old ones.

The first of Marcel Duchamp’s ready-mades, dating from 1913, showed that presenting an ‘everyday’ object as a work of art could turn it into something new. He placed them in an utterly different context where something else was expected of them, so to speak, without him having changed or added anything (save for the customary signature of the artist). “*That Mr. Mutt* (Duchamp’s pseudonym in that circumstance) *made the Fountain with his own hands or not, is not important. He CHOSE it. He took a common object, placed it so that its functional significance disappeared under the new title and the new point of view - he created for this object a new idea.*”²

A bicycle wheel or urinal it seems can lose its original purpose and meaning and take on another. This process of transformation evidently enacted in our minds is nowhere more clearly revealed than in the art of the twentieth century. By being able to perceive a thing differently, our view of things changes and the world changes with it.

A mental clear-out, making space in our minds by ridding them of so much ballast that once meant something to us. And if anyone was familiar with dis-assembling and clearing out associations, meanings and values, it was Picasso.

42.6 PICASSO'S EYES

Picasso's 1942 combination of bicycle handlebars and saddle as a bull's head is, after Duchamp's ready-mades, one of the most miraculous and meaningful art works of the twentieth century.

While a 'normal' collage draws a new narrative from disparate components each with its own story, here two parts of the same mechanism combine into a single new (and different) mechanism that inevitably and inescapably calls to mind the head of a bull. Indeed, so strong is this association that it is difficult to continue seeing anything of a bicycle in it.

The bike is forced into the background by the bull. Theoretically, at least there must be a transition point where the components are so caught up in each other's new sphere of influence that, in a sort of magnetic impacting of meanings, the bull all at once appears or disappears to be replaced by the bicycle, or a notion of bicycle. It may resemble the conjurer's disappearing trick, but there is a touch of magic here too! Picasso himself considered this work complete only if someone, the thing having been thrown out on the street, were to convert it back into a bike.

Yet the artist must have originally seen the animal parts in the cycle parts; he evidently saw them less strongly anchored in their original context. This then is the lesson we can learn from it: new mechanisms can ensue from another assemblage of parts freed from their original context by taking them up in a new chain of associations.

That Picasso was persistently able to see forms in their 'autonomous' - unsignified - state, loosed so to speak from the relationship they formed part of when he came across them, is clear from his studies of eyes that seemingly change into fish and then into birds without effort.

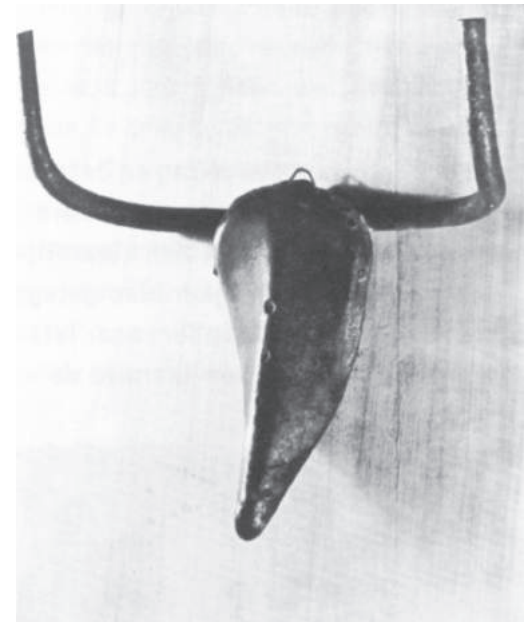
Forms for him - and materials too! - were clearly free and stayed that way until engaged, temporarily, in a particular chain of meanings, or rather, 'system of significations'.

On further consideration we can well imagine that for Picasso it was but a small step for a dish to very literally signify a *corrida*. The fact is, he was obsessed with bullfighting and it was one of the themes that haunted him the way another might see the arena as a well-filled dish.

42.7 DINING TABLE FROM A DIFFERENT CONTEXT

Le Corbusier's table, consisting of a thick cantilevered marble top on two steel legs, found many times in his work and used by him in his own house in the Rue Nungesser et Colli as a dining table, can be regarded as a new 'mechanism'. While not all tables were wooden and had four legs, this had been pretty much the norm, and it was simply accepted that at times the legs would get in the way even when located at the corners (such as when tables are combined to accommodate a larger gathering).

The steel central legs of Le Corbusier's table with their weighted feet allowed a reasonably stable top to cantilever on all sides, giving free leg room all round. A drawback of this solution (one that has to be put up with) is that the enormous weight establishes a place-bound quality. So there are disadvantages as well as advantages. It all depends on circumstances, but it is certainly a novel idea, which makes it interesting to find out how it was arrived at.



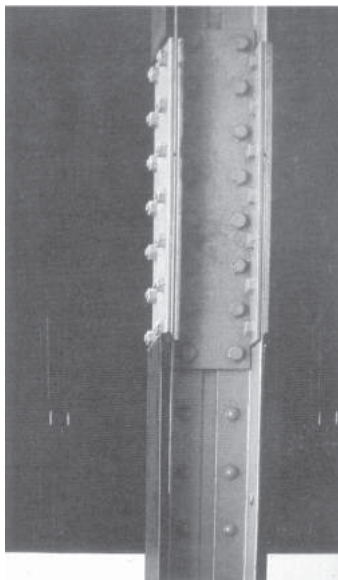
396 Pablo Picasso, *Tête de Taureau*, 1942



397 Le Corbusier, *Dining Table* (Paris, 1933)



398 Pierre Chareau; Bernard Bijvoet; Louis Dalbet, *Maison de Verre* (Paris, 1932)



399 Tie plates and rivets, flanges with slate panels



400 Stylistic amalgam. Bear steel column, a nineteenth century grand piano and art deco furniture

On visiting a hospital one day Le Corbusier saw a dissecting table, being used for anatomical purposes, according to Maurice Besset, making the purely functional advantages mentioned above all the more logical. To see the thing as a dining table was a particularly blunt transformation, one that obviously did not bother Le Corbusier, either when he was designing it, or when it was used daily by himself and his wife. Evidently he could banish the visions of cadavers from his mind and even the channel meant for running off blood is by no means an unpractical consideration for a dining table.

Bizarre though this example may seem, it once again shows that forms are able to change their meaning. But, it also shows that Le Corbusier was able to see this particular form distinct from the chain of associations originally linked with it and slip it into a new chain. The form was freed, so to speak, of its meanings and the framework once containing them, to be given a new infill, 'signified', with other meanings in another context which it was now at liberty to accept.

42.8 CHANGE OF CONTEXT IN MAISON DE VERRE

When it proved impossible to acquire the upper apartment in the courtyard in the Rue Saint-Guillaume, it was decided to remove the entire lower three floors and slip a new house into the existing building. Then a problem arose: the steel columns that were to shore up the remaining portion suspended like a stone bridge in the sky, could not be brought into the building in their complete state. As a result, shorter lengths consisting of sundry steel sections were combined and assembled on site using tie plates and rivets. So ultimately the solution was all-technical in the spirit of the bridge constructions of those days, which for us at least, used as we are to welded joints, have a nostalgic air about them.

Was it originally the intention to clad these columns, thrusting up resolutely through the tall space, so as to mask at least something of their explicitly technical look? We shall never know. What is certain is that the columns as rendered in the well-known perspective drawing contain nothing of this turn of events, germane as such developments are to the practice of building, though generally unexpected.

There must have been a moment when the architects, reviewing the whole in the light of the overall formal world they had generated for the house, decided that it was complete at this stage. And not just that, they had it painted in two colours in such a way that the technical build-up in parts would be more prominent still.

Chareau must have been taken with these columns, unexpected images as they proved to be, fully regaled and free-standing in the space. For aside from the black and red-lead colouring he clad the flanges at places with slate panels. This is something only an artist would think of, one with his roots in Art Deco as evidenced by the innovative use of materials and joints at so many places in this house. So we see Chareau uniting the redolence of disparate worlds into an amalgam with its own individual aesthetic. Add the furniture which together with the steel structure presents a kind of biotopic unit, and it then becomes clear that our acceptance of this aesthetic is grounded not in some law or precept that guarantees beauty, but entirely in the positive associations that each of the components present here evokes in us.

Clearly then, forms and colours (and of course words) change when lifted from their original context and placed in another setting. Extricated from their earlier system of meanings they are now free to take on a new rôle.

Place things in another setting and we see them in a new light. Their meaning changes, and with it, their value, and it is this process of transformation as enacted in our minds that gives architects the key to creativity.

42.9 CHANGE OF CONTEXT AT A DOLL'S HOUSE

In the competition held in 1983 by the magazine AD to design a doll's house (of all things), the submitted plans gave the expected broad spectrum of reductions of contemporary dwelling forms, in the way that doll's houses through the ages were for practical reasons invariably cutaway models of usually well-to-do houses from particular style periods.

Jean Nouvel (of all people) submitted a design and won. And although by no means the greatest of his designs it is certainly one of the most remarkable. Who would have thought of a toolbox as a space for accommodating your childhood memories? Dolls instead of steel implements, one could scarcely imagine a greater contrast. But the oblong terrace-like collapsible drawers unfold their contents so that at least everything is there at hand, a lot more clearly organised than most traditional doll's houses. Although not directly a model of a house that we know, you could well imagine it as such. And although not a reflection of an existing type, it does give an illusion, an idea, of a house.

Do children really feel the need for a reduction of a literal house, where you always have too many corners that are inaccessible, and with the frustration that you cannot really get inside it and always feel shut out as a result? Here in this toolbox your things are always safely stashed away and it is made to carry around.

Come to that, you can imagine Nouvel returning to this idea sooner or later (just think of the 'pull-out' stands of his super-revolutionary competition design for the St. Denis stadium).

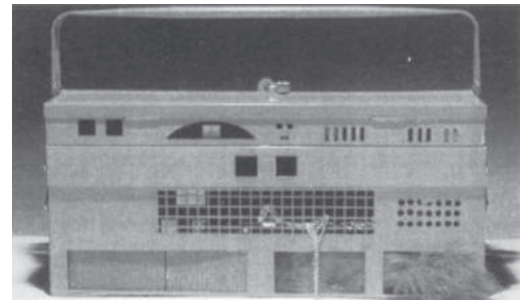
This concept breaks dramatically with the customary doll's house cliché. Not just in terms of the outward appearance and how it fits together, it also shows a revamping of ideas about what it is that children might want from a doll's house, taking note of the fact that they have less need of something representing a literal reality. With their capacity to think conceptionally, they are content with merely the idea of a house.

42.10 ADAPTING TO A NEW CONTEXT

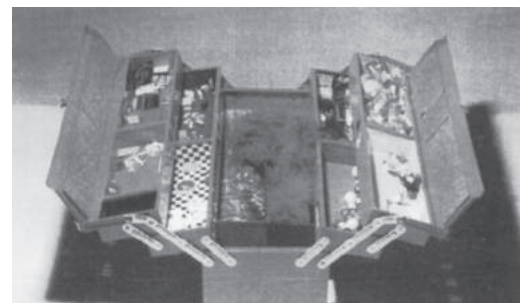
Forms and things can apparently adjust to a new situation and be primed to accommodate a new and opportune purpose. Looked at this way, creativity is seen to originate in an extreme capacity to adapt, in the sense that not only are you adapting to the potentials of things but at the same time those things are adapting to suit you.

"As far as the form of the granito washbasins we wanted to build-in at various places in both the Centraal Beheer building and De Drie Hoven, I got no further than a list of conditions that this form had to satisfy, such as filling watering cans and washing hands. The dimensions were in fact already fixed seeing that they needed building-in to the brickwork, and they had to be cast in concrete. But, what on earth was the form going to be? I tried to impress my thoughts on the others and demonstrated the movement you make when washing your hands by describing circles in the air. Everyone knew that there was only enough money for something very simple and square at the most. It was clear that this rectangular form was completely at odds with the flowing movement I had outlined and would be impossible to keep clean besides. Until, all at once, a polyester hard hat appeared before us on the table. Someone's straying eye had seen it lying in the cupboard. The perfect oval form, exactly the right size, ideal as a mould, simple to install and obtainable for free from the contractor." (1986)

The theory is as follows: new organisations/mechanisms/concepts are found by stepping outside your task and relating it - i.e. by association - to other known tasks and applying them to your case. The difficulty here is the usually limpet-like adherence of these known tasks to their 'original' meanings, something like a chemical compound with a strong affinity, making it difficult for us to conceive of them as freed and interpretable. The space for creativity lies in managing to forget, in demolishing foregoing prejudices and above all in an ability to un-learn. A matter of learning to unlearn, then. The age-old question, which inevitably looms up here as elsewhere is this: Is creativity something you can acquire or is it entirely a question of



401 Jean Nouvel, *Doll's house*, AD competition (1983)



402 Toolbox of childhood



403 Hertzberger *Washbasin*, Centraal Beheer (Apeldoorn, 1970) and De Drie Hoven (Amsterdam, 1974)

apptitude? And, although without aptitude you will obviously make little headway you could still say that the easier it is to pull apart forms and meanings, the greater the potentials for creativity; this means seeing forms more as self-sufficient phenomena, open to more and ever new meanings. Which brings us back to Picasso's ability to see the handlebars of a bicycle as form distinct from its meaning. The question now is whether you could cultivate this potential, and if so, how.

The pre-condition for creativity is that only the smallest amount is fixed for you, meaning that the largest amount is open-ended. The more doubt you have about the fixed meanings and established truths imprisoning you, the easier it is to put these in perspective and the more curious you need to become about other possibilities, other aspects.

Creativity depends on the ability to open your eyes so as to see things in other contexts and in particular beyond the restrictions of the arguments in the closed circle of the 'architectural world'.

It is more a question of mentality than of insight and teachers should perhaps do something about this by stopping scaring students with all that discipline-bound information and instead use the time to challenge students to enlarge the circle of their interest, to see more, to bring in other aspects; to arouse their enthusiasm, receptivity and curiosity, that they ask more questions than they expect answers to, that they experience more of the world, that they widen their frame of reference. Education, and this includes education of architecture students, should, before anything else, unfold mental space so as to explore the unknown, the new, the other and put it within their reach instead of filling the space in their heads with what we know already.

Make them hungry instead of nourishing them with information.

42.11 EDUCATION

The climate at the university is overly determined by fear. Fear on the part of the professors that students will not get a thorough training, and the students' fear of failing to satisfy the expectations of the professors. Yet the two parties agree on one count: it has to do with being able to think about your subject of study, the rest is a question of looking things up. Because you are only able to think when you get pleasure from thinking, it is 'the pleasure of thinking' that should colour every task you are set. The best tasks I know of in this respect are the following:

1. Comparative analysis (introduced by Kenneth Frampton at the Berlage Institute) of buildings. This involves carefully choosing a number of objects that have to be of one type per analysis (i.e. railway stations, residential areas, schools) and expressly suitable for comparison. Groups of students (this can only be done in groups) try to assess, on the basis of what are initially self-imposed criteria, the extent to which the different objects satisfy those criteria and which score the most points. They, therefore, have to think about how a building fits together, why this is so, and whether this really is the case. The basic conditions that projects have to satisfy are exposed together with whatever unexpected and exceptional spatial discoveries they may prove to elicit.
2. Once again, by dint of comparison, a number of preferably large buildings or structures, whose construction was of decisive influence on the underlying concept, are examined to ascertain the degree of influence the form had on the construction or indeed the construction's influence on the form. The exercise gains added depth by the inclusion of examples from the past as well as the present, such as the Hagia Sofia, the Gothic cathedral and the Sagrada Familia, thus presenting quite differently grounded relationships of form, material and ways of spanning. Without referring to history as such, various eras and their specific possibilities can then be compared, thereby laying low the unspoken but generally prevailing prejudice that there is no place for the past in the maelstrom of the present.

42.12 INDESEM

Indesem is a two-yearly International Design Seminar. A short-lived school of architecture held at the Faculty of Architecture in Delft, it is an explosion of learning without education. This time it is the students that decide which teachers they want to hear and what the subjects are to be. Students themselves are one hundred per cent responsible for everything and it is they who see to it that the technical and academic staff warm to the idea of breaking plenty of rules for a week. And you should see what happens when you do! Work continues into the early hours and the building is turned inside out to get at its hidden qualities. The daily routine is disrupted and the cleaners are made aware of their importance.

Spectacular though the week of the seminar undoubtedly is, it is merely the tip of the iceberg of preparations attendant on each new INDESEM when twenty or so individuals are kept busy for at least nine months. Each time a group of students comes together to perform the Herculean task of getting this event off the ground, their own regular studies largely left to one side for the duration. It is only much later that they realise just what they have received in return when, their studies over, it transpires that designing and realising a building demands an identical attitude where it is again all down to anticipating, deliberating, seeking out conditions, making (and keeping) appointments.

The task is enacted in the city. It is not primarily about building itself but about what building in the city does to space.

Those taking part come from all over the world, perhaps initially attracted by names and by the Netherlands, but also for the thrill of actually being able to meet and talk with so many others in the same boat. The task is no more than a pretext and catalyst for coming into contact with others and having something to discuss with them.

No-one really believes that a week is long enough to do more than make a start on a barely under-pinned plan, nor is that the prime reason for INDESEM. The idea of results is chiefly to drive the process. The performance that needs generating is to get a group of complete strangers, almost all of whom are obliged to try to express themselves in a language other than their own, to formulate and present an idea and go on to defend it against all others.

42.13 TAKE HOME ASSIGNMENTS

Part of the curriculum of the Faculty of Architecture at Delft consists of so-called 'take-home tasks': written assignments that students come and collect. These are to be completed and handed in fourteen days later, after which there is a discussion involving the teacher who set the task and those who took it on.

The essence of the task is that you can only resolve it properly through a combination of perspicacity, empathy and enthusiasm. It entails a written rather than a drawn situation; much like the physics problems you get at secondary school. It is a situation familiar to everyone, as intriguing as a puzzle you feel obliged to solve if only to keep up with the others.

These assignments never involve problems, they are challenging more than anything else. They call not for diligent draughtsmanship, but for an idea, a brainwave-in-miniature, and are expressly aimed at bringing out the assignee's own ideas, interpretation and choice of site. Thinking up a problem is possibly just as mentally taxing as thinking up a solution. As a teacher you have to extricate yourself from all the stuff that constitutes ninety per cent of the architect's practice and that you are all too readily inclined to immerse your students in, to show them just what a difficult business it all is. Instead you should be looking for the exciting, challenging and, most importantly, the fun sides to architecture that will arouse interest and hopefully curiosity too.

Looking through the results of the take-home exams, a coherent image has taken shape through the years. There are always a few who get totally stumped and a large group of boring,

decent, reasonable students clearly divided into those who went out of their way to resolve the task and those who ploughed through it with an often remarkable dexterity. But there is also a select band whose responses are frequently surprising and at times even astonishing.

*“The artist doesn’t make what others regard as beautiful,
but only what he considers necessary.”*

Arnold Schönberg

“It is easier to pulverise atoms than prejudices.”

Albert Einstein

43 PERCEIVING AND CONCEIVING

HERMAN HERTZBERGER

Perceiving is the ability to extricate certain aspects from within their context so as to be able to place them in a new context. You see things differently, or you see different things, depending on your intentions in perceiving. Each new idea begins with seeing things differently. New signals bombard you, persuading you that things are not the way you thought, making inevitable the need or demand for a new response. To observe and so understand your situation, your surroundings, the world, differently, you have to be capable of seeing things in another light, seeing those same things differently. For that you need another sensibility, resulting from a different perspective on things, your surroundings, the world.

The architect's most important attributes are not the traditional emblems of professional skill, the ruler and pair of compasses, but his eyes and ears.

At a certain moment in the nineteenth century, painters began painting the patches of light in the shadow of trees, where sunlight falling between the leaves perforated so to speak the areas of shadow. You could say that those patches of light must have always been there, and they undoubtedly were as long as there were people to look at them, yet those painters saw them for the first time. At least they only then became consciously aware of them as an essential aspect of the configuration we call tree. Their attention focused on the exceptional quality of trees as providers of shade and shelter, and on the fact that people tend to linger there rather than elsewhere. Searching for other things, with the shift in attention that brings, they became conscious of aspects they had in fact always seen without being aware of it.

Often it takes painters and their interpretations to make you aware of how things hang together. For instance we see the landscape of Provence influenced by the way Cézanne experienced it; we are in fact looking through the painter's eyes. You become aware of what you are actually seeing only when that perception occurs in the right context at the right time. Pre-historic caves with paintings on the walls, now regarded as pinnacles of artistic endeavour, were discovered at a second viewing, long after they had been closed up because no-one had then seen anything in them.

People began perceiving things that, until then, had simply had no part in the general frame of reference. There was no interest in them because the focus was on other aspects that were more relevant to them then. So other glasses were needed, so to speak, 'to see what had not been seen to be seen'.

43.1 SELECTIVE PERCEPTION

The same tree observed by an ecologist, a biologist, a forest ranger, a painter and a transportation planner is seen by each through different eyes and therefore regarded and valued quite differently.

Whereas the biologist probably assesses its health above all, the forest ranger calculates roughly how many cubic metres of timber it would give him, and the painter appreciates its colour, form and maybe the form its shadow throws. For the transportation planner it is bound to be in the wrong place. All look at things through their own glasses and consequently assess things quite differently, each within their specific context.

We can regard such specific contexts of assessment as a system of significations, and this system is accessible to the focused eye of the practised observer. Eyes that are experienced in a particular area see the smallest difference that would be missed by those skilled in other areas and remain hidden to them. So, for instance, it seems that Eskimos can see from the type of snowflake whether it comes from the mountains, the sea or from any other direction, something that is of vital importance to them to be able to find their bearings in an endless expanse of snow that otherwise has nothing recognisable to offer.^a Indians are able to distinguish the presence of hundreds of plant species, and from several hundred metres away

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404 Max Liebermann *Restaurant 'De Oude Vink'* (Leiden, 1905)

* This text is based on: Hertzberger, H. (2000) *Space and the architect: lessons in architecture 2*. Originally published in Dutch: Hertzberger, H. (1999) *De ruimte van de architect: lessen in architectuur 2*.

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a Hall, E.T. (1966) *The hidden dimension*.

too. If this is inexplicable to us, it is equally inexplicable to them how, for example, we can distinguish and identify so many kinds of red lights and other signals on the roads at night, lights that cause us to slow down hundreds of metres away because they tell us that something may be wrong farther along the road.^a

Everyone has an eye for a particular system of meanings because it is of special and relevant importance to them. They hardly see the other things if at all, such as the jungle-dweller who leaves his native forest for the first time and pays a visit to Manhattan. When asked what struck him the most he replies that the bananas were bigger than those back home.

Thus throughout the history of painting, and in that of architecture, we see different aspects coming to light that, each as a coherent system of meanings, made claims on the attention, evidently because at a certain time they were important or simply regarded as particularly attractive. Focusing on certain related aspects infinitely increases your powers of discernment *vis-à-vis* that relationship, yet it seems as though you can only focus on one area of it at a time.

Fixated on that one area, you are blind to everything else which, though potentially perceivable, fails to get through to you. It is as though you need all your attention for that one aspect on which you are concentrating and to which you are clearly receptive.

When holidaying as a family in France, our children were dragged from one cathedral to the other without their interest being aroused in the slightest. They only had eyes for coffee-makers, scooters and most of all a new phenomenon in those days: parking meters. Until one day they suddenly made their way to the cathedral in Auxerre. Had we finally managed to kindle their enthusiasm for the richness of this form-world that occupied and inspired us so? It took us only a short time before, having scrupulously scanned the surroundings, we succeeded in isolating from its exuberant backdrop a type of parking meter they evidently had not seen before!

43.2 PERCEPTION FROM EXPECTATION

Travelling through a remote desert area in India en route for Rajasthan, in all the stations you are served tea in fragile earthenware bowls that most resemble off-yellow flower pots without the hole at the bottom. Once empty they are thrown out of the train window where, with a dull plop, they smash to smithereens on the pebbles between the rails. The reverse of this phenomenon is that of our throw-away plastic cups; considered worthless in the West, there they are so exceptional that anyone succeeding in acquiring an intact example places it as a source of admiration among the other treasures set in a special place in the house. Isolated as a unique exemplar in a culture of mainly handcrafted artefacts it can only be regarded as a creation of unattainable refinement. It is only with the greatest care that we managed to bring back undamaged one or two of those supremely fragile bowls as an elementary example of primitive production to our industrialised world, where they occupy a special place in our home as relics of a world lost to us long ago.

We only perceive what we more or less expect to find, confirming our suspicions as it were, in other words there is an element of recognition. Thus discoveries are in fact always re-discoveries and, invariably, the missing pieces from an already conceived totality.

The researcher can do little with phenomena he encounters that are impossible to fit into his research, based as it is on a known theory. Should he not wish to ignore those new phenomena, all he can do is accommodate them in a new theory using inductive reasoning. It is not merely that we can only see things as part of a context (system of significations, field, paradigm). For a thing only has meaning and value when placed in the context of the relationship in which it performs, the situation, the environment it occupies. To be able to perceive something it has to hold your interest, you have to have been searching for it to some extent, even if unconsciously. It seems as though certain fascinations, perhaps borne with us since

5 Lévi-Strauss, C. (1962) *La pensée sauvage*.

our childhood, persist in guiding or at all events influencing our preferences and decisions as well as our powers of discernment. You could call this secret force intuition.

Schliemann, the man who discovered Troy, was apparently able without prior knowledge to point out the right hill to start digging which indeed was to reveal the city, covered by nature as it had been and quite invisible. It cannot have been anything other than co-incidence, but why did he decide to start digging there as opposed to anywhere else? Psycho-analysts explain the accuracy of his actions through the resemblance of the Trojan landscape to that of Schliemann's childhood in the Rhineland.^a His intuition - what else can you call it? - arguably was guided by an unconscious experience that had stayed with him from his childhood.

There has to be an impulse to excite the interest; curiosity comes before perception.

When Le Corbusier came across that marble table on two solid legs in the dissecting room of that hospital he must have recognised the form as an answer to one of the questions that had been haunting him: the dining table he had still to design that would not be the usual four-legged affair. Or had he long borne it in mind as an 'interesting solution' for possible use at a later date?

43.3 PROCESSING PERCEPTION

Even today Le Corbusier is still the greatest purveyor of ideas, concepts and images which, stored in his schemes, are still being adopted by the latest generations of architects, whether consciously or unconsciously. So what he himself accumulated from the past gets imperceptibly passed on as inspiration and converted into fuel for modernity.

A great many, mainly young architects see little in the past with its forms, materials and working methods which they regard as no longer applicable because these belong to another brief, with other labour relations and for other social contexts. Might knowledge of past forms guided by nostalgia not encourage an eclecticism of old stylistic traits?

Yet the occasions when Le Corbusier adopted historical forms almost literally, as in the Ronchamp chapel - call them direct influences - are few and far between. Come to that, everything he borrowed, or stole if you prefer, became profoundly modern through his intervention, such as the use of coloured glass, admired by all and sundry in Chartres Cathedral without it occurring to them that it could be applied in a modern setting.

Influencing is in the main an indirect and usually unconscious process of transformation, but you can also perceive in such a way that, looking through the expression of the form, you can, as it were, single out what of it may be of use to you. You are then interpreting what you see in a new rôle that is apposite and applicable to you. This is how characteristics come to be selected with a more universal value than their original stylistic manifestations.

Unlike historians, who tend to foreground traits that adhere typewise to a particular period, architects are more keen on those elements that do not. Because these have not lost their validity they could well be of use to us. We visually extract what we can use, indifferent to what the original intentions may have been, and label it timeless. It is the timeless that we seek, and, these days timeless means of all time. Elements unhitched from a particular time frame are those with a more general significance and ever present in different guises, evidently because they can be traced back to basic human values which persist, if with varying emphasis, in the way that different languages share an underlying generative grammar. You need history not just to see what happened when and where and how different or unique it was and if there are breaks in the thinking, but also to establish what it is that is unchanging, to recognise the underlying structure of similarities that we can merely piece together, like a pot unearthened shard by shard.

History keeps unearthing different aspects of an unchanging structure under changing conditions.

a Niederland, W.G. and H.F. Stein (1989) *Maps from the mind: readings in psychogeography*.

43.4 COLLECTIVE ARCH-FORMS

“The only available escape from the fundamental limitations of our imaginative faculty lies in directing our attention more to the experiences we all have in common, the collective memory, some of it innate (!) some of it transmitted and acquired, which in one way or another must be at the base of our common experiential world. (...) We assume an underlying ‘objective’ structure of forms - which we will call arch-forms - a derivative of which is what we get to see in a given situation.

The whole ‘Musée Imaginaire’ of forms in situations whatever their time and place can be conceived of as an infinite variety out of which people help themselves, in constantly changing variety, to forms which in the end refer back to the fundamentally unchangeable and underlying reservoir of arch-forms. ... By referring each one back to its fundamentally unchangeable ingredients, we then try to discover what the images have in common, and find thus the ‘cross section of the collection’ the unchangeable, underlying element of all the examples, which in its plurality can be an evocative form-starting-point.

The richer our collection of images, the more precise we can be in indicating the most plural and most evocative solution, and the more objective our solution becomes, in the sense that it will hold a meaning for, and be given a meaning by, a greater variety of people.

We cannot make anything new, but only reevaluate already existing images, in order to make them more suitable for our circumstances. What we need to draw on is the great ‘Musée Imaginaire’ of images wherein the process of change of signification is displayed as an effort of human imagination, always finding a way to break through the established order, so as to find a more appropriate solution for (the) situation.

It is only when we view things from the perspective of the enormous collage, that, with the aid of analogies, we can resolve the unknown and, by a process of extrapolation arrive at solutions which can improve the circumstances.

Design cannot do other than convert the underlying and the idea of ever being able to start off with a clean slate is absurd, and moreover, disastrous when, under the pretext of its being necessary to start completely from the beginning, what already exists is destroyed so that the naked space can be filled up with impracticable and sterile constructions. The various significations of everything that has taken place, and is still taking place now, are like old layers of paint lying one on top of another, and they form for us, in their entirety, the undercoat on which a new layer can be placed; a new signification which will slightly alter the whole thing.

This transformation process, whereby the outmoded significations fade into the background, and new ones are added, must be ever-present in our working methods. Only by such a dialectical process, will there be a continual thread between past and future, and the maintenance of historical continuity.”^a

43.5 COLLECTION OF REFERENCES

In the above quote dating from 1973 the emphasis is mainly on forms, conceived as time-dependent interpretations of more universal ‘arch-forms’. What we are concerned with is the kind of space those forms generate and for this we must expand the idea of a ‘Musée Imaginaire’ of images to include the space forms that they result in. Whereas forms always more or less bear the stamp of their time or place, space - even if their counterform - steps outside that time and place, conceptually at least, and is therefore less time-bound.

When considering architecture of other times or places, we need to turn our eyes from the things to the space these give shape to, and look beyond what is too specifically formed to distil the essence of that space, thus shifting the emphasis from the architecture to what it is that it manages to generate in the way of views and protection and what can happen as a result.

a Hertzberger, H. (1973) *Homework for more hospitable form.*

The more you have seen or the more impressions you have experienced in whatever other way, the bigger your frame of reference. We cannot be greedy enough in our cravings as 'receiver' of images wherever, whenever, whatever. Everything can produce useful associations: butterfly wings, feathers and fighter planes, pebbles and rock formations, images that enlarge the space at the architect's disposal.

And then there are all the imaginable situations people can find themselves in; you have to recognise and identify these to bring those people to the centre of attention.

Your ability to generate ideas that lead to new concepts is contingent on the wealth of your frame of reference. And the wider the horizon of your interests, the sooner you can break free of the snare of architectural inbreeding of forms that are doomed to keep reproducing while their substance diminishes; and the greater your chances of avoiding the backwash of tricks and trends everywhere about. It is precisely by not thinking of architecture that you come to see analogies with other situations that incite new ideas (by seeing it more as X you discover its potential fitness for Y).

Your frame of reference, as it happens, also works in reverse: in the design process, it is by establishing which potential possibilities are unsuitable as a response to a particular task, the negative selection if you like, that you become aware of the direction you must then follow. Not only do you become more aware while working of what you are, in fact, looking for, criteria of quality also suggest themselves. These set themselves up as touchstones that inform you whether you have 'arrived' or need to keep on searching: designing is rejecting.

More important than being sure of what you want is knowing at least what you do not want, and so to design is most of all to keep looking and not be too easily satisfied with what you find.

The richer and more universal the influences you concede, the more mental elbow room you create for yourself. It is a question of exploring of everything there is, everywhere and of all time to discover how old mechanisms can be transformed into new ones by eradicating the old meanings and rebuilding them for new ends. It is, then, a question of making your frame of reference as large as possible.

43.6 EXPERIMENT-EXPERIENCE

The more experience you acquire, the clearer the bigger picture becomes, but regrettably it is also the case that the closer your experiments bring you to knowing what works, what is fit and what is not, the more your open-mindedness disappears and experience slowly, but surely strikes home. This process shows a certain analogy with the way space seems pre-destined to make the transformation to place.

Accumulated practical acquaintance leads eventually to experience, habituation and finally routine, as a result of repeating formulas that have proved to be successful. In spite of yourself, you measure every new experience against the quality of all foregoing experiences of a like nature, so that your chances of finding something new that is better than what you already know keep diminishing, and so for most people the need to continue searching will diminish too.

So we see everyone doomed by a natural process of selection, so to speak, due to the tendency to follow self-made paths, thus with a minimum of risk.

When this preference for previously trod paths goes hand in hand with a decrease in curiosity, it means that we are adapting more and more as time goes by to the possibilities, instead of seizing and exploiting these possibilities by adapting them to us.

The more you experience, the more experience you gain. All garnered experience remains in place and works with you in establishing values, and so influences your thinking and irrevocably restricts your freedom. Experience is what you know of the world and because of it you adapt to the world, whether you want to or not.

“Our brains persistently urge us to change our surroundings in such a way that we fit there, but when the limit is reached the reverse happens: our expectations and needs are modified until they fit the surroundings. The first happens in childhood, the second after that. Only artists manage to persist in the first stage.”^a

First, we make the world, later the world makes us. The architect’s thinking, which guides his creative process and production, is controlled by the tendency to deepen and perfect his earlier discoveries on the one hand and to keep doing it differently with the hope of making new discoveries on the other. That is how we move constantly between experiment and experience. That is to say, risks and danger (*periculum*) obtain when we embark upon experiment, whereas experience safeguards us against them.^b

The more experience takes over, the more earlier weaknesses will be eliminated and in time what we experience as quality will gain strength. Experience finds its own way and every teacher helps it in this by being naturally inclined to want to administer knowledge. Experience rests upon knowledge and insight, whereas experiment by contrast is out for discovery, finding the unknown. Experience assumes that the aims are clear. This is not the case with experiment. Yet, all too often we see ideas launched like unguided missiles with an excess of energy and enthusiasm, yet the targets are vague or simply not there. It would be fine if experience and experiment were to act as complementary categories, but unfortunately they oppose one another instead and that is the dilemma of the creative process.

If only we could escape our experience.

43.7 THE GUIDING CONTEXT

You have to step outside the context of your profession and be in a position to draw your ideas from a wider context than that of architecture which although itself revolving keeps taking its arguments from other arguments within its own system. Ideas relating to form or space can never derive from architecture alone. This raises the crucial discussion of whether there is any real point to such ideas. What are the things you can and cannot say with architectural means, and do they lead anywhere?

As an architect you must be attuned to what goes on around you; open yourself to the shifts of attention in thinking that bring certain values into view and exclude others. The extent to which you allow yourself to be influenced by these shifts is a question of vitality. That architecture changes is not just a hedonist, narcissistic, unconditional hankering, as in fashion, for the spectacularly original in the design of the exterior, but over and above that its ability to capitalise on what it is that shifts in society and in the thinking on society, and the new concepts that are discovered as a result.

Architects must react to the world, not to each other.

Architecture must be about something other than just architecture. Just as the painter needs a subject, so too the architect needs to have something to say that rises above the obscure jargon that architects share with one another. But it must also rise above obediently following and implementing some brief. Many of our colleagues are happy to have managed to cram everything in, within the budget and within the site boundaries. Though this may be an achievement in itself, you cannot call it architecture yet. Moreover, it is debatable whether anyone stands to benefit from it at this stage.

Often it seems to be something new, but is in fact an age-old formula that appears new when looked at differently; the proverbial old wine in new bottles.

Actually, every new design should by rights bring new spatial discoveries: exhilarating spatial ideas not encountered in that form before, in response to newly diagnosed conditions. You should be asking yourself each time what it is you really want, what idea - limited or expansive - you are trying to express. If this is a formal fabrication only, however interesting theoretically, is it of any good to anyone, and if so, in what way? Again, though, what is to be

a Hillenius, D. and N. Tinbergen (1986) *De hersens een eierzeef*, open lectures at the University of Groningen.
b Tuan, Yi-Fu (1977) *Space and place*.

given up, sacrificed, what is to be gained and what lost and for whom? Inevitably, these questions imply what it is you in fact expect of architecture, except perhaps instant fame.

On completing each design, you should once again ask yourself whether the result, despite all its efforts to look interesting, is indeed more than merely built output expressible in so many square (or cubic) metres of building; while there is nothing wrong with that, neither is it a reason to call it architecture, let alone art. This makes the self-satisfaction of architects about the import of their offerings more than a little disconcerting.

43.8 IDEA AND CONCEPT

Every new step in architecture is premised on disarming and outspoken ideas that engender spatial discoveries: call them spatial concepts. A spatial concept is the way of articulating an idea in three-dimensional terms. It is only as clear as the idea that produced it. The more explicitly it is expressed, the more convincingly the architect's overall vision comes across. A concept can be defined as the more enduring structure for a more changeable 'infill'. It encapsulates all the essential features for conveying the idea, arranged in layers as it were and distinguished from all future elaborations as, say, an urbanistic idea, set down in a masterplan and interpreted at some later date by sundry architects each in their own way. To concentrate the essence into a concept means summarising in elementary form all the conditions of a particular task on a particular site as assessed and formulated by the architect. Trusting on the insight, sensibility and attention he accords the subject, the concept will be more layered, richer and abiding and not only admit to more interpretations but incite them too.

It is the conditions as they obtain for that particular task that foster the idea for a design and the concept distilled from it. Those conditions dictate that the end-product satisfies that idea and that its special qualities get expressed as 'hallmarks'; this way the idea encapsulates the DNA, so to speak, containing the essence of the project and guiding the design process from start to finish. The concept, then, is the idea translated into space - the space of the idea, and bearer of the character traits of the product as these will emerge upon its development.

Designing, basically, is a question of finding the right (read appropriate) concept for the task at hand. But, all too often concepts, however dazzling they may be in their own right, are dragged into the proceedings and pitched at the world with no thought given to whether the task in question has anything to gain from it.

Our work needs placing in the context of society, whether we like it or not, venturing beyond the safe haven of architecture where we designers together attach meaning and weight to formal inventions. Admittedly, things always look good in the country of the blind, but beyond its borders the takers are usually few and far between. Genuine spatial discoveries never ensue from the mental cross-breeding in the small world of architecture. They have always been inspired by the wider horizon of society as a whole with its attendant cultural changes, whether or not incited by social and/or economic forces.

With each new task - and this implies components of a building, each and every one of which can be regarded as a distinct task - you should always ask yourself what purpose it serves in society, what idea it represents and what, finally, is the issue it seeks to resolve.

43.9 CONCEPT REACTING TO TASK CONTEXTS

You have to fathom out what is, and is not, required of a particular task; which conditions are germane to it and which are not. You need the right species of animal, so to speak, that fits, or meets, those conditions that apply specifically to the task in question. Whether we are designing for savannahs with tall trees or for more swampy terrain will determine whether a giraffe or a crocodile is the most appropriate choice of beast. But, architects are usually all for designing a giraffe for a wetland region and a crocodile to keep the tall trees company.

What conditions, we should be asking, form the immediate cause and the departure-point for the direction a design will take?

The assumption that an idea underlying a design needs to fit the task does not mean that the concept can be deduced from it. It all depends how you interpret the conditions. For spatial discoveries you have to move beyond the bounds of the task, in other words beyond the surveyable area, to be able to see this in a wider context and then interpret it through inductive reasoning in its enlarged context.

The idea that points the design in a particular direction needs to be strong enough to free the task from the confines of its conditions and overcome the clichés entrenched in it.

It is important that the concept guides the elaboration of each distinct component if there is to be cohesion between the idea of the whole and that of the components. Every design of consequence presents a coherent narrative, built up as it is from components that have something to say individually and in concert rather than contradicting and counteracting each other.

Only by thinking through the project consistently and sensitively can the architect safeguard overall quality and prevent the design from being no more than a gimmick. Just think of the number of prize-winning competition designs, chosen for their sterling underlying concept, that come a cropper when fleshed out. What marks out a good architect is that his schemes only improve by being worked out in detail.

The eventual design is always an interpretation of the concept. Another designer would probably have made something else, as everyone has their own individual world of associations to throw at it.

A concept has to be challenging, must incite responses. It must leave room for multiple interpretations and say as little as possible about solutions in a formal sense, or about form, and concentrate all the more on the space.

Thinking in such proto-forms pre-supposes an abstraction towards the syntactic, such as pictograms which encapsulate the essence of a message. Concepts, then, are ideas expressed as three-dimensional ideograms.

In the practice of design, a guiding idea is seldom forthcoming right away. First it is noses to the grindstone on the strength of a few vague suspicions and only after persistent kneading of your material, and with a better overview of the field of conflict, do your objectives begin to assume shape. The biggest danger is that of the rash solution which you find yourself stuck with before you know it, a groove that is all too difficult to escape from. By contrast anything seems possible when drifting without a fixed course but it will not lead you anywhere.

The concept may be a compass, but it is hardly the final destination of the design process. The end-product can be nothing other than a development and interpretation of that concept, the way one might apply or render an overall vision. Thinking in terms of concepts, models, strategies etc - deriving as this does from seeking out the essence of what you are occupied with - does mean that there is a danger of that abstraction all too quickly leading to simplification. The issue is how to couch complexity in simple formulas. Who has never been lured by the bait of simplicity and who would not be inclined to reduce or rather distil until only the essence, the basic idea, remains?

43.10 THE COMPLEXITY OF SIMPLICITY (OR THE PITFALLS OF REDUCTION)

Simplicity is more easily associated with true, pure and serene than with barren, dull and poor. Every architect strives after simplicity, even if only because 'truth' would seem to equal simplicity. Saying 'I want to make something very simple' is construed as an expression of extreme modesty. Unfortunately not everything that is simple is also true, pure and serene.

Many architects think that leaving things out is a surefire way of getting to heaven. The seduction of 'less is more' often leads all too easily to 'all skin and bone' - at excessive cost. Once you have acquired a taste for omitting things you are in real danger of succumb-

ing to *anorexia architectura*. The ‘art of omission’ consists of leaving out only those things that are irrelevant, in the way that a sculptor (Michelangelo, by all accounts) was once asked by an admirer how he could possibly know that a beautiful woman was to be found inside the unhewn stone. Of course, the answer is that he must have had the form of the finished figure in his mind to begin with. You can only reduce a thing when you know what and what not to leave out; you have to know exactly where you are headed: you have to have a concept.

Omission is a dangerous business and whether less is indeed more depends entirely on the concept you had to begin with; this is what decides what can go and what must stay, not some assumed will to simplicity. Simplicity is not an end in itself, you arrive at it during the design process while searching for what is essential to your concept. Leaving things out is less a question of reduction and far more a process of concentration.

It all depends on what you want to express - not with the absolute minimum of means, but as clearly as possible without being thrown off course. It is obvious that you can say more with more words, but what the poet does is to arrange just those words in just that order so as to express what he wants to say as clearly and as precisely as possible.

“Where economy of means is concerned, architects could learn much not only from engineers but also from the poet: the way in which he selects his words and structures them into sentences to achieve maximum power of expression and beauty of sound: ‘la poésie est une chose aussi précise que la géométrie’ (Poetry is as precise as geometry, Flaubert). What we term poetry is particularly that utmost precision of thought, which while reducing its means can actually increase the layers of meaning.”^a

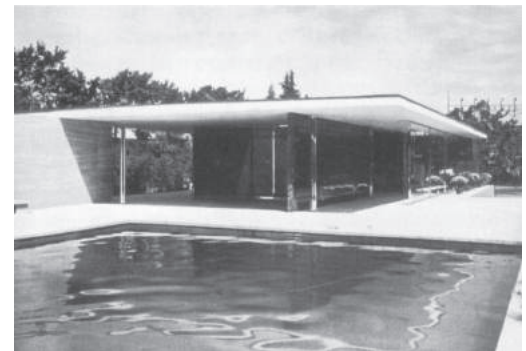
Each time for the form-giving architect there is the tightrope to be trod between too much and too little, between ‘under-designed’ and ‘over-designed’.

In that respect the engineer can serve as an example to the architect; after all, his aims are simpler and fixed firmly in advance. His task is easier, say organising a certain span with a minimum of material, or with the least structural height. For that matter, you usually need complex constructions and measures to achieve outward simplicity. Here, too, simplicity can fool you. For instance when rebuilding Mies van der Rohe’s Barcelona Pavilion it proved a supremely complicated business to reconstruct the slender slab of cantilevering roof and uphold the appearance of simplicity. Again, the expressive roof of Jean Nouvel’s concert hall in Luzerne must have required moving heaven and more especially earth. The structural tour de force rids the building of its objectness. With its seemingly wafer-thin roof and the way it spreads out across the surroundings, the building conjures up visions of a gigantic bird that has just landed, having chosen this monumental waterfront site between the mountains as its territory.

43.11 CONSTRUCTIVISM

Showing how a building is constructed is a spectacular invitation to all-embracing form. Although this does express the essence of constructivism it does not necessarily result in space. Form expressed along constructivist lines is a demonstrative show of the pride its makers had in making and achieving structures that were unattainable (and less necessary) before then. They were, therefore, the symbol of a new era of new and unprecedented possibilities. And of its space, though the sense of space was ultimately due to the elegance of ease rather than the heaviness of effort. Which is why we prefer the poised quiescence of the ballet dancer to the tensed muscles of the weightlifter.

Attractive as it is to show how things fit together, and legitimate too, if only to keep then from getting too abstract and therefore unnecessarily obscure, there comes a moment when the aspect you wish to express begins to dominate all the others.



405 Mies van der Rohe *Barcelona-pavillion*



406 Jean Nouvel *Concert hall, Luzern*



a Hertzberger, H. (1992) *Introductory statement* in ‘The Berlage Cahiers 1’.

In addition, structures and constructions have the tendency to visually become increasingly complex and more and more difficult to understand, so that their expression imposes rather than informs. This holds not only for expressing how a structure is made, but also as to its purpose, which is more likely to be concealed in such instances than revealed.

Just as modern technology is no longer self-explanatory in a visual sense, so functions and allocations, volatile as they are, are suffering a marked decrease in identity as time goes by. We will have to accept that buildings, like household and other appliances, are showing less and less of their contents and their workings, and starting to behave increasingly like urban containers.

Architects are continually competing to make the most beautiful box. With control over the contents looking likely to disappear, the form of the packaging has become more important than the form of the contents. *'l Esthétique du miracle'*, as Jean Nouvel puts it.^a

With the expression of how a thing fits together and what its specific purpose is pushed into the background, the concern for objectness cedes to an expression of the spatial idea - activating, enfolding and unfolding both construction and function - and the spatial characteristic this brings to bear. The more we are able to make, the more pressing the question of what our intentions are. First you have to have an idea of where you want to go before setting up a strategy to achieve that aim.

43.12 HEAD AND HAND

Do we think while we draw or draw while we think? Does the hand guide the head or the head the hand? Was there an idea before we began designing or did the idea arise during the design process?

At first sight this would appear to be a non-issue. Of course, you draw as you search and search as you draw and this way you immerse yourself in the task. The longer you work on a task, the more clearly focused its essence becomes. While proceeding you subject all manner of references to scrutiny and so ultimately arrive at an idea and an approach. 'Begin, and the results will follow'.

The artist, unlike the architect, can count perhaps on one of the themes he has been nursing for some time to yield results in the end. In the films of Picasso painting, he gives the impression that his ideas emerged spontaneously to be just as easily erased and replaced by new ones. Later, when his endless series of sketchbooks was published, it transpired that each motif in his paintings was carefully prepared beforehand and often even practised, as a performing artiste would do.

The architect's tasks, other than those of the artist, are more specific in the sense that each task makes its own conditions that require an appropriate answer. Unlike the artist, he is not in a position to throw random ideas about. The architect's ideas concern less autonomous concepts which can only be applied, in general, to the most specific circumstances, that is, if those circumstances did not produce them in the first place.

The danger of 'just beginning' to draw and design in the hope and expectation that something will come of it, is that before you know it you are resorting to well-trod paths or clichés. This is virtually unavoidable, as it happens, for it is impossible to envisage something that was not there to begin with. You are borne on by what you already knew, because you yourself, but more particularly others you admire, have already left a trail. The composer Hector Berlioz relates that, as possibly the only composer unable to play the piano, he was at an advantage compared with his colleagues who were in the habit of composing at the keyboard, so that like it or not they were drawn by their hands to already familiar sequences of already familiar chords.^b

"The tyranny of keyboard habits, so dangerous to thought, and from the lure of conventional sonorities, to which all composers are to a greater or lesser extent prone."^c

a Jean Nouvel, lecture at the Berlage Institute, Amsterdam, 1996.

b Cairns, D. (1987) *A life of love and music. The memoirs of Hector Berlioz 1803-1865*, p. 13. 'My father would not let me take up the piano; otherwise I should no doubt have turned into a formidable pianist in company with forty thousand others. He had no intention of making me an artist, and he probably feared that the piano would take too strong a hold of me and that I would become more deeply involved in music than he wished. I have often felt the lack of this ability. On many occasions I would have found it useful. But when I think of the appalling quantity of platitudes for which the piano is daily responsible - flagrant platitudes which in most cases would never be written if their authors had only pen and paper to rely on and could not resort to their magic box - I can only offer up my gratitude to chance which taught me perforce to compose freely and in silence and thus saved me from the tyranny of keyboard habits, so dangerous to thought, and from the lure of conventional sonorities, to which all composers are to a greater or lesser extent prone. It is true that the numerous people who fancy such things are always lamenting their absence in me; but I cannot say it worries me.'

c Idem.

We know that Mozart heard entire works in his head before committing them to paper. This enabled him to turn those endless journeys in bumpy carriages to his advantage. Why should not architects design buildings ‘in their head’? Are plans and sections really more complex than the voices of, say, twelve musical instruments, each with its own timbre, such as need weaving together in a symphony?

First you must have something in mind (heard or seen), call it an idea; only then can you note it down - although of course it is never quite as simple as that. Drawing can bring out an idea, give it a clearer outline if you like, but it must have been in your subconscious to start with. It should proceed more like research. The researcher does not start anywhere, at random, he does not begin without an idea, a hypothesis, about what he expects to find, and where. That he may well ultimately end up with something other than he sought is another matter.

43.13 DESIGN PROCESS

“The architect’s design process, as such, should be viewed more as a method of research. It should then be possible to make explicit the steps of the process, so that the designer is better able to realise what he is actually doing and what reasons are guiding him. Of course, sometimes you may discover something seemingly out of the blue, but those moments, for the architect at least, unlike the artist, are rare. Mostly, when you muster up enough courage and take the trouble to be conscious of it, the underlying thought process will prove to be less mysterious than that of the pure artist. We work according to strategies to achieve specific aims, preferably with as limited means as possible. We make use of practically all the resources and techniques which the researcher uses in, for example, operational research.”^a

But, for those who flinch at the usually strict rules that scholars wield with such gravity, we can look closer to home.

The working method in the design phase in many ways resembles cooking. Even when the cook works without a recipe, he has a fairly clear idea about what his aims are, and before he can start he must gather together the necessary ingredients. If certain spices turn out to be missing from his kitchen cupboard, then the outcome will be a different dish from what he had in mind. In the same way the architect, bearing in mind the requirements his design will have to meet, can draw up a shopping list of ingredients, as it were, with which he intends to set to work.

“Cooking consists of a fairly complex set of actions, undertaken in an order that is apparently without logic, at least without any logic that might correspond with the logic of the end-product. For instance, some ingredients have to be soaked beforehand, or dried, cooled, heated, thickened, or liquified, be kept for a long time on a low heat, or stirred vigorously for a short time on a hot burner, and all these actions are undertaken in an order that bears no resemblance whatsoever to the order in which the final product is eventually served on the table. Similarly, the design phase proceeds in an ostensibly chaotic fashion, and we must not try to impose an artificial order onto the different stages, because it does not work like that.”^b

43.14 PART AND WHOLE SIMULTANEOUSLY

“What we can do, is to keep in mind, throughout the design process, the final product as we envisage it in its totality, and thus ensure that the initially fragmentary image slowly but surely comes into sharp and complete focus.

That is why you should, ideally, concern yourself with all aspects of a design at the same time, and of course not only with how everything is going to look, but especially with how it is to be made and how it is to be used.

While absolute simultaneity in the work on all aspects of a design is impossible, it is at least possible to spread our attention evenly and alternate our focus of interest with due deliberation, so that all the screws, as it were, can be tightened in turn - a little, not too much at a

^a Hertzberger, H. (1995) *Designing as research*.
^b From Hertzberger, H. (1992) *Do architects have any idea of what they draw*.

time - until the correct all-over balance is achieved in the work as a whole. The greatest danger constantly threatening us is that, fixated as we often are on a small problem whose solution eludes us, we spend too much time on that one problem, more because of a psychologically felt necessity than because of a demand inherent in the design. And paradoxically, when an excellent solution eventually presents itself, it often has a disastrous effect on the design as a whole. After all, the more convincing that (partial) solution is, the more strongly the temptation becomes to adapt the rest of the design accordingly, which inevitably results in lopsided development.

There was once a painter, who spent an inordinate amount of time on a portrait that he was finding impossible to get right. Everyone agreed with him about that, and incidentally also about the fact that one feature, the nose, was outstandingly good, unlike the rest of the face. This nose met all the demands that could possibly be made on it, it was indeed the sole component that was truly finished. So it was not surprising that the painter, falling into his self-made trap, kept on altering the mouth, ears and eyes, erasing them time and again from the canvas and starting all over again, in the hope of portraying the right mouth, ears and eyes to go with the already perfect nose. Until another artist came along and saw his predicament. He offered to help, and asked for the palette knife. In one fell swoop he dealt with the problem - to the horror of our painter. He had slashed the only successful feature of the face. Once the handsome nose had gone, the only obstruction to the painter's ability to see things in their proper proportions had gone, too. In the wake of this destructive deed came the possibility of a fresh beginning.

The complexity of the architect's design process and the underlying thought pattern is in a sense also comparable to that of the chess player, who also has to deal with a great variety of possibilities and choices and mutually influential factors. The chess player who becomes too preoccupied with the possibilities offered by one particular piece is punished with disasters that will inevitably occur elsewhere on the board. And just as the chess player (like the cook with his efficacious but apparently random sequence of actions) keeps track of all the possibilities of the game, the architect too must develop a manner of thinking that enables him to monitor the range of his attention so as to take in as fully and as simultaneously as possible all the inter-related fields of interest. Only then can he arrive at a design in which the different aspects are properly and fully integrated in the whole. Both chess player and cook succeed in developing new strategies to deal with ever-changing situations, and also the architect must be capable of undertaking his design process according to such strategies, so that the form does not evolve without consideration for construction and material, the organisation of a floor plan not without consideration for accompanying sections and the building as a whole not without consideration for its environment.”^a

43.15 THE FLOORPLAN IS NOT A DESIGN

“A particular difficulty is faced by the architect ... he cannot represent his ideas in reality, but has to resort to representing them by means of symbols, just as the composer only has his score with which to render what he hears. While the composer can still more or less envisage what he has created by checking to hear what his composition sounds like on the piano, the architect depends entirely on the elusive world of drawings, which can never represent the space he envisages in its entirety but can only represent separate aspects thereof (and even so the drawings are difficult to read).

That is why the average architect usually starts by getting his floor plan technically right, whereupon he may think up an interesting section to go with it, after which he must finally complete the structure with façades that remain within the framework of the possibilities of floor plans and elevations. This unsatisfactory state of affairs is maintained and even aggravated by the fact that the drawing, irrespective of the meanings it seeks to communicate, evokes an independent aesthetic image, which threatens to overshadow the architect's original intentions

a From Hertzberger, H. (1992) *Do architects have any idea of what they draw.*

and which may even be interpreted by the maker himself in a different sense than initially foreseen. A complicating factor is that, due to the sheer superabundance of this type of image and our constant comparisons with antecedents, which has given rise to a sort of meta-language full of such things as lucid concepts, well-positioned staircases, interesting spatial effects - in short an insider's jargon of extensive qualifications which do not refer so much to the actual building as to its abstract graphic representation on paper, i.e. to an expectation.

However absurd this may sound, we must in all seriousness ask ourselves how many architects are actually capable of reading their own drawings, that is of interpreting them with an eye to the spatiality of the structure that they are supposed to represent, as well as to the social and utilitarian objectives. Most architects read their drawings as an autonomous graphic image, thereby involuntarily placing them on a par with the graphic work of an artist.

'Thus the architect can be said to be the prisoner of his own drawings, which seduce and mislead him by their own imagery and which do not transcend the confines of the drawing board.'^a

The space we visualise relates to our drawings as a landscape does to an ordnance survey map. Exactly perhaps, but two-dimensional and most particularly incomplete.

43.16 DESIGNING IS THINKING

Designing is in the first place thinking, and then drawing as you think. It is not just visualising something that goes with what you are drawing, but much rather rendering by drawing what you visualise. Other than that, it is a question of organising your imaginative powers as best you can. Designing is a quest that you want to have proceed with maximum efficiency, purposefully if possible.

Therefore you should not fritter away too much time chasing fly-by-night 'solutions' that shortly after have to be dropped - there was something you overlooked after all - for the next rising impulse. All this leads to is depressing piles of sketching paper. It is better to leave the paper and certain the computer screen alone and begin by thoroughly exploring the field. Just as detectives in popular TV series needs to first grasp the plot before they take off after the villain, so the design process consists in principle of a like period of looking, listening and fixing the conditions.

Prior to resolving the task, the designer must develop ideas proceeding from his insight into the full complexity of the task, that lead to a concept, just as the doctor diagnoses the problem before embarking on a therapy. The concept contains the conditions you wish to fulfil, it is a summary of your intentions; of what needs saying; it is hypothesis, and premonition. There can be no quest without premonition; it is question of finding and only then seeking.

"D'abort trouver, chercher après."

Jean Cocteau

a From Hertzberger, H. (1992) *Do architects have any idea of what they draw.*

44 FORMATION OF THE IMAGE

TAEKE DE JONG
JÜRGEN ROSEMAN

This Chapter in an epistemological intermezzo in which psychologists, philosophers and artists enter the discussion (and the picture) regarding formation of the image. This short overview cannot do this topic justice. Positions will be briefly elucidated. Whoever wishes to read more is referred to other literature via the references. From the entire argument, only one pointer towards creativity is given: creativity pre-supposes leaving behind at least one notion otherwise considered self-evident. Furthermore, the idea that formation of the image pre-supposes a goal will be criticised, as this just shifts the issue of creativity to the concept of a ‘goal’. A goal, after all, is an image.

44.1 CONSTANTS IN CHAOS

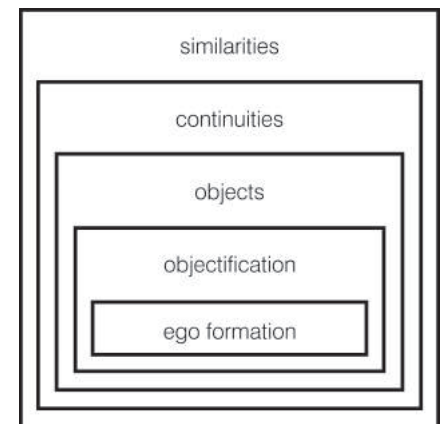
The great developmental psychologist Piaget describes a newborn’s visual worldview as a *tableau mouvant* of disconnected shapes and colours (chaos).^a Similarities and continuities must first be recognised to begin to be able to think *about* the world. It is not self-evident, for example, that a baby’s experience of his mother from a distance is the same as his experience of her from up-close. The visual impression of both is completely different. It is only through repeated experience of amalgamated and formative images in this *tableau mouvant* that the baby realises this process involves an object that changes place in perspective outside of one’s own body, but that otherwise remains the same itself (‘object constancy’). What is equally uncertain is the subsequent distinction between one’s own self and something that, on the basis of externally observed object constancy, leads its own life (‘objectification’). The difference between ‘I’ and that, which has been made into an object, has been postulated by Fichte^b as the first pre-condition for thinking. The object then temporarily remains a *object distinct* of the observer: “I see an object”. If the child later gives a verbal description, it becomes an active *subject* of a sentence: “the object is yellow”.

44.2 ‘INSIDE’ AND ‘OUTSIDE’

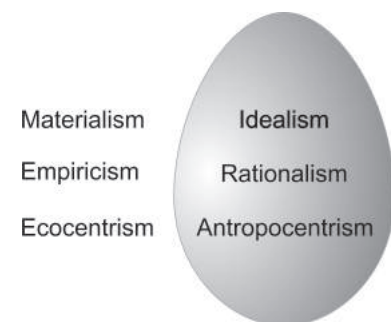
A familiar philosophical position proposes that the difference between what takes place inside and outside of our thinking is theoretically improvable, that the ‘I’ is the only thing about which one can make a statement (solipsism). This is understood in psychiatric disturbances as autism. This extreme assumption that there is no outside world, certainly raises the question, as an experimental idea, of what one’s own thinking would consist of if there were no conceivable astonishment *about* some unexpected thing that exists outside of us.

Psychological experiments depriving people of external stimulation (sensory deprivation^c) are never endured by volunteers longer than three days, and lead to hallucinations. According to some, forced sensory deprivation will, based on several known cases with babies and animals^d, lead to death. The neuro-physiological system requires external stimuli. If one pre-supposes a stimuli producing outside world (easy to do), then the question arises where, precisely, the border lies between the observer and the externally observed. The problem with the relationship between “inside” and “outside” of our thinking has been studied in philosophy for 3000 years.

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407 Continuities in similarities



408 External and internal priority

a Piaget, J. and B. Inhelder (1947) *La representation de l'espace chez l'enfant*.
 b Fichte, J.G. (1799) *Grundlage der gesamten Wissenschaftslehre (1794)*.
 c Sensory deprivation has been investigated by many psychologists, see Vernon, J.A. (1963) *Inside the black room, studies of sensory deprivation*.
 d See Montagu, A. (1971) *Touching*.



409 Magritte, R., *La condition humaine* (1934) Private collection, Paris.



410 Ghirlandaio, Domenico, *An old man and his grandson* (1480) Musée du Louvre, Paris

- a Plato can be seen as the founder of idealism. He thought of observed objects as reflections of ideas (comparison of size). Hegel gave the most extreme 19th century elaboration of this.
- b Descartes is the most important founder of rationalism. In his very readable *Discours de la méthode*, doubt as the result of contradictory notions in his environment is the main motivation to only trust in his own reason. Descartes, R. (1637) *Discours de la méthode*. Recent edition: Descartes, René and Clarke D. M. (1999) *Discourse on*

Is the observed only a projection of our way of seeing, or our underlying ideas (idealism^a, rationalism^b, and anthropocentrism^c, largely developed in continental Europe) or is there something more in our thinking than simply everything that has passed through our senses or even through our mouths^d (materialism^e, empiricism^f, ecocentrism^g, all of which are largely Anglo-Saxon)? Projecting an idea into a new context is obvious in design, in the making of artefacts, and in taking action.

44.3 'TRUE' AND 'POSSIBLE TO EXPRESS'

One finds several of the many attempts to unify both streams in human thinking in Kant (critical idealism^h), Husserl (phenomenologyⁱ), and logical empiricism (logical positivism, neo-positivism). Logical empiricism is now considered the most widespread foundation of scientific thinking. Here, the expressability of thoughts in the form of language (logos, logic) forms the border of pure empiricist thinking. Science is only that which can be communicated. Wittgenstein (“*Wovon man nicht sprechen kann, darüber muss man schweigen*”) taught as a Viennese philosopher in Cambridge (amongst, for example, Russell, Keynes, and Skinner) and was thus also a literal bridge between continental and Anglo-Saxon thinking. The discovery in (particle) physics^j, biology (animal behaviour theory^k) and sociology^l that every reality is upset by human perception then set in motion yet another fundamental relativisation of perception.

44.4 INTERSECTION OF SENSES

According to Piaget, another crucial moment in the formation of consciousness in child psychology is the pre-supposition that what you see and feel can be ‘the same’ object. This requires that at least two very different, even theoretically incomparable impressions from two senses (for example vision and taste) repeatedly appear at the same time. Experiments where children are able to feel something without seeing it and are then shown the same thing without feeling it lead Piaget to conclude that at the age of approximately one and a half (for some a bit earlier, for others a bit later), one’s conceptual capacity comes into existence. At the intersection of the two synchronous but various (syn-aesthetic) sensory impressions, the idea (the concept) liberates itself from an object that one can immediately feel and see. From that moment onward, one can also imagine that object without seeing, feeling, hearing, or smelling it.

Considered from this perspective, one has to see the popular children’s game of ‘peek-a-boo’ as a serious string of repeated empirical experiments based on testing the hypothesis (by means of various sensory impressions) that objects continue to exist even though one does not always see them. The stereotypical shaking of the head or dancing to and fro goes hand-in-hand with the way small children will, as soon as they can stand, devote large and amounts of visual attention to the parallax between the foreground and background of what they observe. The child will often laugh as a result, which leads parents and grandparents to intervene, although this laugh is often not meant for these observers; the child starts to cry when the outsider affectionately interrupts the child’s experiments. The adult’s face in the background is, at that point, nothing more than an interesting demonstration of the parallax^m that confirms notions of object constancy.

- method, and related writings.* Recent Dutch edition: Descartes, R. and Th. Verbeek (1997) *Over de methode*.
- c Anthropocentrism proposes that ‘the world’ and therefore ‘nature’ form part of human culture. “Humans are the measure of all things”.
- d Feuerbach: “You are what you eat” (“*Der Mensch ist was er isst*”).
- e De Lamettrie (man is a machine) en Feuerbach (see previous note) are the most outspoken representatives of materialism.
- f Locke, Hume and Stuart Mill are the major Anglo-Saxon predecessors of empiricism who opposed rationalism.

- g Ecocentrism contrasts with anthropocentrism. It considers people and their culture a product of evolution.
- h Kant proposed that sensory impressions could be stored into 16 categories such as space, time, quantity, quality (Kant’s categories). They represent the reception of impressions as systematic-critical bookcases of the consciousness.
- i Husserl (phenomenology) proposed forgetting about interior and exterior worlds (“put them between quotation marks”) and instead focusing on the construction of their interface, the window on the world: phenomena.

Continued on next page

44.5 IMAGINATION BY INTERVENTION

An often under-estimated sense has to do with the use of our locomotor system. Even without feeling, seeing, and smelling, we can ascertain the relative position of our arms and legs, their weight, and what they are bearing. This enables coherence in our movements in space (co-ordination) and in time (synchronisation) and therefore also enables effective taking of action. Sequential reporting of our other senses on the basis of our actions (sensory motor system, the empirical cycle *avant la lettre*^a) is, according to Piaget, crucial for the development of the ability to imagine (conceptual capacity).

After the Second World War, this insight had an enormous influence on education. Since Piaget, more attention was consciously paid to manual dexterity and gymnastics during primary education. Children can now, thanks to his research, get up out of their chairs more frequently during lessons. Many new teaching methods try to use the locomotor system in the formation of concepts. This is perhaps also a call for the use of models in design education. The science of making (technique) may benefit from a scientific notion that avoids the philosophical discussion between empiricists and rationalists by proposing: “‘True’ is what works” (pragmatism)^b.

44.6 A SERIES OF ACTIONS

Conceptual capacity is defined by the biologists Harrison, Weiner, Tanner and Barnicot as “the ability to maintain an overview of a series of actions of which only the first can immediately be executed”.^c One could add: “and of which only the last brings satisfaction” (yet this is difficult for an observer to establish). In this respect, people are different animals. This capability pre-supposes Piaget’s definition, but goes further.

In archaeology, without written sources, discovery of tools provides proof of the early presence of people, even if various species also display the beginnings of this kind of capacity.^d The individual involvement of intrinsically senseless actions into an overall functional whole is not yet proof that the sequence of actions is seen in its totality (planning). With instinctive actions, one can still imagine a built-in stereotypical programme (routine, compare this with computer programmes) set in motion as result of triggering stimuli from the environment (with computers, the external tasks of ‘click’, ‘enter’ or ‘run’) without being consciously planned.

44.7 SETTING ROUTINES IN MOTION

The research of animal behaviour experts (ethologists) is specifically focused on genetically pre-determined series of actions and triggering stimuli that set them in motion (Tinbergen^e). Building nests, for example, will only begin at a certain temperature and solar position, and then only in specific environments. Humans also have any number of such routines, that can be learned partially, and that do not require further conceptual capacities. There is a counterpart in psychiatry: the blocking stimulus is very important. In these cases, setting in motion the theoretically self-evident routine is blocked. Removing these blockades is an important field in this discipline, and in design education as well. Sometimes attention from others can have a blocking effect. The idea is to unlearn the blocking habits by becoming conscious of unspoken pre-suppositions, and going back to their origins.^f

See Husserl, E. (1913) *Logische Untersuchungen*. Recent English translation: Husserl, E. and D. Moran (2001) *Logical investigations*.

This phenomenology had a major influence in the 20th century on his student Heidegger, on Sartre (existentialism: “Existence expresses itself in liminal experiences”) and their followers Foucault, Lévi-Strauss (structuralism: “The social structure drives our expression, our language”) and Derrida (postmodernism: “Grand narratives are deconstructed by external remarks in the margins”).

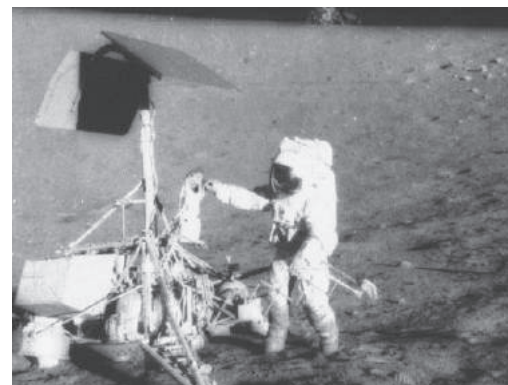
j Heisenberg demonstrated that the energy one draws from the motion of atomic particles in the process of perception

leaves us fundamentally in uncertainty regarding the location, or regarding the time of what is being perceived.

k Tinbergen, N. (1953) *Social behaviour in animals*. describes cases in which, for example, the behaviour of birds cannot neutrally observed.

l The Hawthorne experiment demonstrated that even a survey into working conditions was itself a work condition that improved performance. Roethlisberger, F.J., W.J. Dickson et al. (1939) *Management and the worker*.

m The shifting of object and background as a result of the observer’s motion.



411 ‘True’ is what works



412 A series of actions

a Groot, A.D. de (1969) *Methodology: foundations of interference and research in the behavioural sciences*. considers the cycle of experience, action, experience as the basis of science. One must therefore interpret action as the construction of models. Originally published in Dutch: Groot, A.D. de (1961) *Methodologie: grondslagen van onderzoek en denken in de gedragswetenschappen*.

b In 1878 C.S Peirce introduced the term ‘pragmatism’. William James popularised it (pluralism) and F.C.S. Schiller (humanism) and John Dewey (instrumentalism). G. Papini, and H. Vaihinger (“Concepts are tools which have us behave as if they were true”) elaborated on these ideas in various directions.

c Harrison, G.A. (1964) *Human biology*.

d On one hand one can consider the capacity needed to use tools, and apes do have this capacity, yet on the other hand is the question of the capacity to produce tools, and apes do not have this capacity (or have it only to a very limited degree). If they are taught a language, it seems that they can use it and pass it down to their offspring. See the various animal behavioural studies on the behaviour of apes.

e Tinbergen, N. (1953) *Social behaviour in animals*.

f Gaudi: “Originalidad es: volver al origen”, originality means returning to the origins.

In order to distinguish between conceptual capacity and routine, one has to be able to ascertain that the involved series of actions (or the results they lead to) have not yet taken place in the given form or context. In exceptional cases, this might even have to do with a genetic mutation, where co-incidence is the creative factor. Yet when artefacts are repeatedly created by an organism, this can be ruled out. One is then dealing with creative conceptual capacity (creativity).

44.8 CREATIVITY AND ROUTINE

Some routines can be learned. This can be done by aping all actions in the sequence (master-and-apprentice), but people can then only go through the motions, and then repeatedly follow the recipe. Over time, this becomes routine. Therefore, a goal-orientated and creative conceptual capacity is initially necessary to finally develop the automatism that then liberates this conceptual capacity for other tasks. The dark side of such routines is that one forgets one's pre-suppositions, and can no longer account for them. They become self-evident actions, also pre-supposed by those watching. This often leads to the case where those who practice these exercises (and who are often well-known) are bad teachers. The concept of 'culture' can be explained as the collection of unspoken pre-suppositions during communication: what does not have to be explained in a certain context, because it is already considered obvious. Some pre-suppositions in a culture are theoretically no longer capable of being traced: they are already pre-supposed in communication itself.



Academic

Impressionistic

413 Body or light

Left: Bouguereau, *Jeune fille se défendant contre l'Amour* (1880) Museum University of North Carolina in Wilmington.^b
Right: John Singer Sargent, *The canvas* (1889) Brooklyn Museum.^c

Language is just such a routine that, when being learned, pre-supposes creative conceptual capacity to connect words to experience. After that, it gives wings to creativity, but can ultimately also obstruct it as a collection of clichés which force themselves in. A new idea often consists of new combinations of routine ideas. The negation of one or several existing routines and assumptions is an important source of creativity. The ambiguity of the French word 'néant' is telling: denial and birth. Thus we see in the origins of Impressionism the rejection of the academic notion that objects need to be painted in one colour scale if they are to be to recognisable.^a This led to a completely new way of painting.

44.9 CREATIVE CONCEPTUAL CAPACITY

Creativity assumes a conceptual capacity according to Harrison *et al.*, and is also implied by Piaget, though it encompasses more and occurs less frequently than routine. This added value is attributed to an assumedly goal-orientated quality of human activity. Aimless experimentation (playing) can, however, also lead to something new (for example the invention of electrical power, or of Impressionism) when the formation of a goal is only addressed *afterwards* (electric motors, light bulbs, computers, Expressionism). A goal-orientated quality is thus not a *pre-condition* for creativity. A desire, goal or schedule of requirements is, after all, always an assumption of the result, be it an incomplete idea requiring means-orientated elaboration.

This again suggests the question *how one can take an idea to the point that it is no longer an already existing idea*. Let us call such an idea a 'conception' in order to distinguish it from Piaget's notion of a 'concept'. This question essentially refuses generalisation, and, therefore, predictive empiricism. Empiricism can only study existing pre-suppositions or causes verbally and visually, and not locomotorically their origins themselves (*generating* experience, which usually is temporarily transferable between master and apprentice). If this were the case, one would be able to predict new formations, along with their elaborations. Design would then no longer exist. The requirement of empirical research, i.e. that there be a problem from which an objective can be derived, which then has to be made operational in terms of concepts in order to begin the actual research itself, pre-supposes the creativity that is needed to devise objectives and to put concepts into operation. This research cannot therefore entirely solve the issue of creativity on its own.^d

a See Struycken, P (1996) *De impressionistische doorbraak*.
b Source: <http://sunsite.dk/cgfa/bouguereau/bouguereau2.htm>
c Source: http://www.jssgallery.org/Thumbnails/Sargent_Paintings1889.htm
d Further reading on creativity: Vanosmael, P. and R. de Bruyn (1992) *Handboek voor creatief denken*; Csikszentmihalyi, M. (1996) *Creativity: flow and the psychology of discovery and invention*.

44.10 APPLIED COMBINATORICS

In order to achieve recognition as an empirical researcher, some design researchers let themselves be seduced by the idea that a design is *exclusively* a new combination of existing assumptions (existing routine assumptions regarding situations, urban ensembles, buildings, constructional elements, building components, abstracted into types). In this sense, design is a form of applied combinatorics. The defenders of this position bypass the question how these assumptions themselves ever came about, or they implicitly assume that they need only indicate a historical co-incident, like mutations in genetic evolution.

Yet, the number of new formations per year, or even per day, makes this pre-supposition improbable. In addition, one cannot learn to cook exclusively by using a summary of all recipes and ingredients ever devised (like Durand proposes for education of architects).^a Choosing from this abundance also assumes this negation, from the perspective of one's own preferences (discretion), while creativity even pre-supposes, except for new combinations, a rather focused rejection of generally accepted pre-suppositions (operative or typological *criticism* according to Argan^b or Tafuri^c, see page 103).^d

44.11 CONCEPTUALISING WORK OR ITS RESULT

In order to clarify creativity, one must distinguish between the spatial assumption of the result, and the assumption of the action or series of actions that lead to it. This demands a diverse (pattern and process-orientated) conceptual capacity, probably because they use the various senses (sensory and locomotor) as basic assumption or reference. There was a good reason for construction management to separate from the architectural profession as a distinct discipline. With this discipline, one that is more orientated to temporal sequences, there is indeed still design, though it is a kind of design based on a series of generally recognised actions with interim results. There are various series of actions that can lead to the same result, and the same actions can, in another sequence or in different circumstances, lead to a different result. This lack of a direct causal relationship between series of actions and result is a problem in business management with regard to the empirical model.^e

44.12 MAKING IMAGINATIONS

Despite this division on the process side of things, the architect (designer of the result) has to operate on another level of abstraction with a process (work): the management of consecutive design actions in order to arrive at a design. Let us call this 'design management'. Some designers, like Carel Weeber and Frank Lloyd Wright, claimed to see suddenly the final result before their eyes as a flash: architects with the 'magic touch'. Drawing is for them just routine elaboration of the conception. The design itself would then not be 'work', but rather inspiration without perspiration.

There are three reasons for doubt. One has to do with an internal process of theoretical transformative assumptions, or an experience that smacks of routine. Furthermore, many renowned designers, especially when working in a team-context or design competition, insightfully unfold their design process with interim results, which then form the basis for the subsequent design session. This is also advisable for beginning design students so that they obtain insight into their own strengths and weaknesses. Fundamentally, the 'future' of this process is largely unpredictable; there is always a case of beginning anew on the basis of what has been already achieved, or parting ways with what has already been achieved, and falling back on previous phases.

The crucial questions are always, "How do I begin to design? What do I accept from what already exists (including the previous design results) and what do I reject?" For designs that are more likely to be completed in phases, the dialogue with paper or screen, or construction of a model, is an accepted and sometimes crucial phase between taking inventory and analysing effects in the design process. In order to get a better grip on phases like the scientifically traceable process (without a preordained sequence), one should not presume a

a Durand, J.N.L. (1975) *Precis des leçons d'architecture* (1819).

b Argan, G.C. (1965) *Sul concetto di tipologia architettonica*.

c Tafuri, M. (1968) *Teorie e storia dell'architettura*. English translation: Tafuri, M. and G. Verrecchia (1980) *Theories and history of architecture*.

d See for a discussion of Tafuri and Argan, and for additional references Engel, H. (1999) *Hybride interventies*.

e Riemsdijk, M.J. van (1999) *Dilemma's in de bedrijfskundige wetenschap*.

priori that there is one “best” method per context (series of phases and their sequences) that one should adopt as routine for designing in other contexts.

44.13 MORE DESIGN METHODS THAN DESIGNERS

Perhaps the candid starting point would be that there are just as many design processes as there are designs. Methodology is then not the establishing of all of these design methods, but rather “understanding each other’s methods”. If there is anything that can be *generalised* about design, this is included, but here this involves *generating* designs and only afterwards analysing their effects empirically. This evaluation of the design consists of projecting familiar relationships onto the new context of the design, and there is always doubt regarding the validity and reliability of this (see page 92). An important part of design education consists of trying to find the most productive sequences of (nameable) design actions and routines for each individual student.

The disciplines of construction management and design have gone their separate ways so as to give the designer the opportunity to develop his own more fruitful dynamics, apart from the construction process and therefore presumably in the competition of the marketplace. The designer who meshes this process with that of the standard construction process is lucky, as no differences in phase appear between his creative process and the interim products that the construction process successively demands. This is the case, for example, with designers who begin with a grid that establishes the basic structural frame (and thus the position of the foundation piles as well), and who only later complete the process of adding the final details that do not need to be known until later in the construction process. Again, many good designers are inspired precisely by these details in order to use the principles of form and measure that result from them in a total design.

44.12 IDEA AND ENVIRONMENT

The pre-eminent example of order in nature, the crystal, grows on the basis of an exogenous contamination. The accidental form of this contamination extends in the growth of the crystal as dislocation in the roster, without which the free molecules would not be able to find any point of application to allow the crystal to grow. This is a warning for perfectionists. Without small heterogeneities in the air, no raindrops could condense from saturated vapour, and no snowflakes could find a starting point to grow uniformly in six directions. Some designers need to find at least one exogenous starting point, even if this seems of secondary importance, in order to base their integral work upon it.

The remaining context then leads to new dislocations. The starting point is often the specification (of which a schedule of requirements may form a part), or the topography or bordering of a site, but it could also be an artificial fascination, an impression from the past. The capriciousness of these starting points sometimes awakens the desire to find once again an autonomously continuing idea (for example a grid) from which the constructional elements derive their dimensions (as in an automatism), and upon which they can be based. The designers of sweeping, often sudden interventions find precisely therein their formal (morphological) starting point, which can then be projected onto the specification and the site. Yet a crystal is not a design; it is the result of a physical automatism.

Every homogenous design theme winds up on the borders of the given site; it runs off into fascinating interim variants, or forms remarkable contrasts with the adjoining plot. This dialectic between homogeneity (or autogeneity) and heterogeneity in the creative conceptual capacity brings us back to Piaget or Fichte. One can also see a relationship with the dualism between idealism (Plato) and realism/relativism (Aristotle), rationalism (Descartes) and empiricism (Hume), the Expressionism and Impressionism of the 19th century, psychological distinction between projection and identification, and methodological distinction between goal-orientated and means-orientated design.

45 EXPERIENCE, INTUITION AND CONCEPTION

ADRIAAN GEUZE
JOB VAN ELDIJK
LENNEKE VAN KAN

45.1 INTRODUCTION

This is the report of a design process of a student of Adriaan Geuze. The report describes the design for the transformation of a grain silo in Katendrecht, Rotterdam, into a residential structure. Each illustration indicates an important step in the design process.

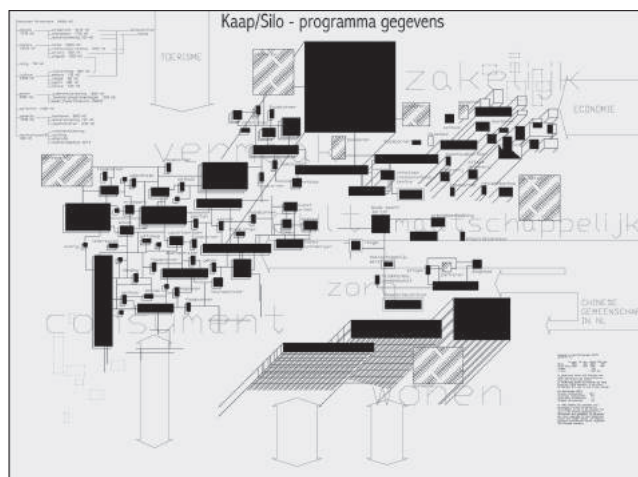
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I am convinced that personal events, anecdotes, passion, urge for survival and fear of dying are contributing greatly to 'quality' and creative products. Callas, Cruyff, Otis Redding, but also Aldo, all have employed at a time methods (probably intuitively and unconsciously) to link together their youth, passion and talents. I have often experienced that it is possible to connect one's students to their own background, dreams and affinities and that through this a more intensive and authentic result is generated. Designing by your gut is also proven to be attainable by some people. Allergies and frustrations may well feed a design process. It is possible to put nightmares on a pedestal and next dance in triumph around it.

It is my experience that in Design Schools (like the one in Eindhoven) the intuitive and the subjective are considered the most important values; in Delft we term this unscientific, not fit for engineers. Yet we must learn to draw from these mysterious reservoirs, these pits of degeneration and suffering. It is important that this will yield nothing, if at the same time the systematics, the context, the programme of requirements and the feasibility are not taken into account. That should also be taught to our students. How to connect one's own difficult young age to the question put by a principal or school? Unfortunately, self-respect and insight into one's personal character and roots are obligatory; and I do not know how that would be done within a method.

I will explain my ideas concerning the design process on the basis of the graduation project of a student of mine, Marten de Jong, who made a design for the Elevator Building in southern Rotterdam. The design trajectory may be rendered in various characteristic stages. In my personal design process I am making these steps as well, although at a higher speed because of routine. It comes even to a point, that I go through the first and the last stages concurrently, since they are the most interesting ones.

45.2 DESIGN PROCESS

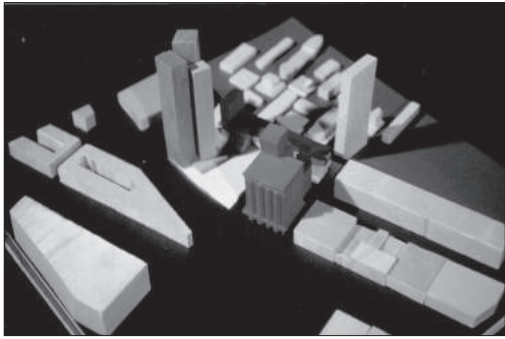


414 Stage I Analysis of the location

Analysis of the location and quantitative study of the programme of requirements are very important; that way ideas may emerge you would never have discovered just by yourself. In the present case it concerned the questions: What is going on in Rotterdam? What is happening with an area transforming from a nautical one into a residential one? The analysis intended to study how the Chinese community might be able to take residence here. The final product of this stage was a programme of requirements for that site.

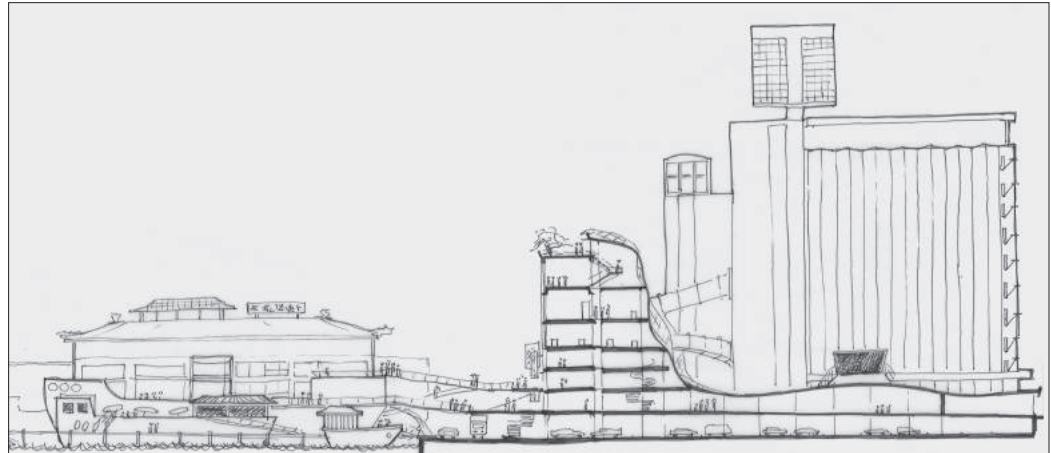
Of the location Marten de Jong said: *"I selected the building, not the location. However, such a factory is obviously located somewhere; that proved to be Katendrecht. At that moment, and, maybe, still now, a rather 'hot spot' in Rotterdam. In order to come to grips with the context of the task put to myself, an analysis of Katendrecht was indispensable. To get it really at my fingertips thorough analysis was needed; history, plans for the future, development plans, earlier initiatives, spatial effectiveness, fascinations in the environment, connections of Katendrecht with the rest of the city, traffic analysis, etc.. With such a variety of perspectives you do sense more quickly whether certain solutions are good or bad. A good solution is linking all these aspects, addresses them all; half a solution just does not work. 'What I wanted to do in the first place' is then also not working anymore, I just wanted to do something with the building, not with the area as a whole. And as soon as the location started to play a rôle, the first pre-occupations were already long off the table."*

The area of the grain silo: Katendrecht, used to be a China town, a red-light district, and was cleared in a city renovation project. With the data from the study Marten then interviewed members of the Chinese community.



415 Stage II Making the findings spatial

During this stage the main thing is to make the programme of requirements spatial, piling up little building boxes, whilst keeping in mind the luggage of the programme of requirements just developed. Marten discovered that the programme could be realised in an existing elevator building. That complex could be stripped inside and voids could be filled in with the programme. This was the beginning of his study.



416 Stage III Specific questions

When this preliminary work was done, Marten could formulate the questions of the study. They were two: Can a post-war industrial monument serve a programme with a high social profile? And: What is the meaning of architecture for a cultural minority?

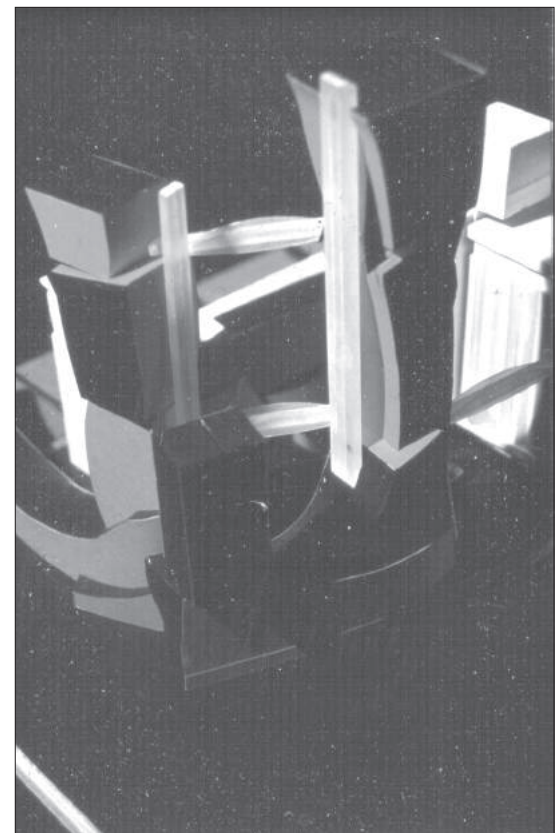
It is a highly interesting question, since it is involving a taboo in The Netherlands. What to do with minorities: do you build especially for them, or do you see to it that they adapt themselves?



417 Stage IV Study of material and construction

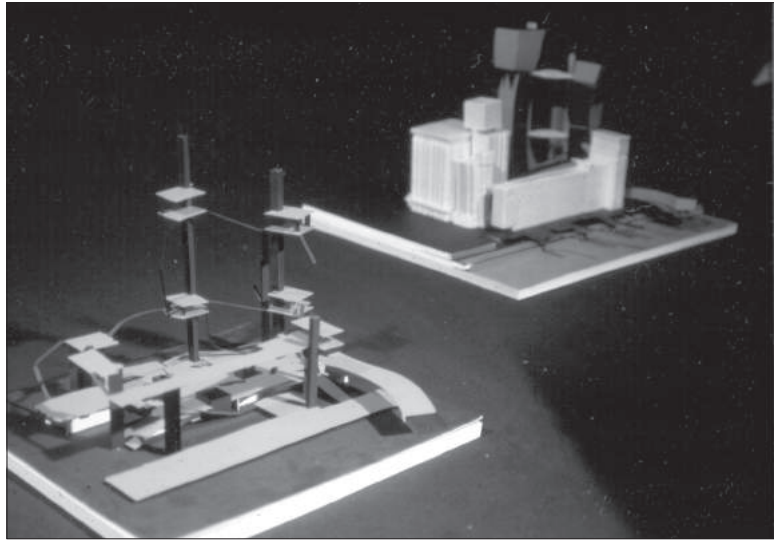
Next, a study was conducted – among other points – of the possibilities offered by the existing concrete construction. It was important to assess how many holes could be drilled in it.

I considered it to be of great importance that Marten would be steeping himself in Chinese architecture, that he would go to Peking so to speak and that he would read a great many books. The results of his study contributed greatly to his design. One of the most significant conclusions from the study of Chinese architecture proved to be that empty surfaces as we know in modern architecture are completely absent in the Chinese tradition of building. Other discoveries included, for instance, the significance of the circle, Feng Shui and detailing. In addition the massive use of colour was striking. These findings became guiding motives in the design.



418 Stage V Stuck

Just as in each graduation process, Marten got stuck at a certain moment in time. He knew everything, but could not go anywhere. He discovered that the adding of all conclusions does not lead to a sound design. It was not beautiful; it was too much; it did not fit. He had soaked up everything like a sponge and could neither advance nor retreat.



419 Stage VI Gaining depth

The first step towards a solution was halving the programme to be developed; opting for the most inspiring part; and, within it, what was the most promising. That meant coming out, completely subjectively, from his personal background and historical past. The part he selected was the Elevator Building. For the design he needed more self-confidence, more trust in his own fantasy, getting rid of that Delftish stuff called reasoning. Then a grand formal language was unleashed, a quest for his own sources, for inspiration. How to apply in such a business-like, 'Rotterdammed', stark and inhabitable building a warm and juicy layer? The answer resulted from the study of the location, from the interviews he had with members of the Chinese community and the study of Chinese architecture he had now to conduct one more time with the new insights in the back of his head. In addition I asked him to study the work of Leonidov in order to find a link between the theatrical and the functional.



420 Stage VII Beyond being pleased by one's self

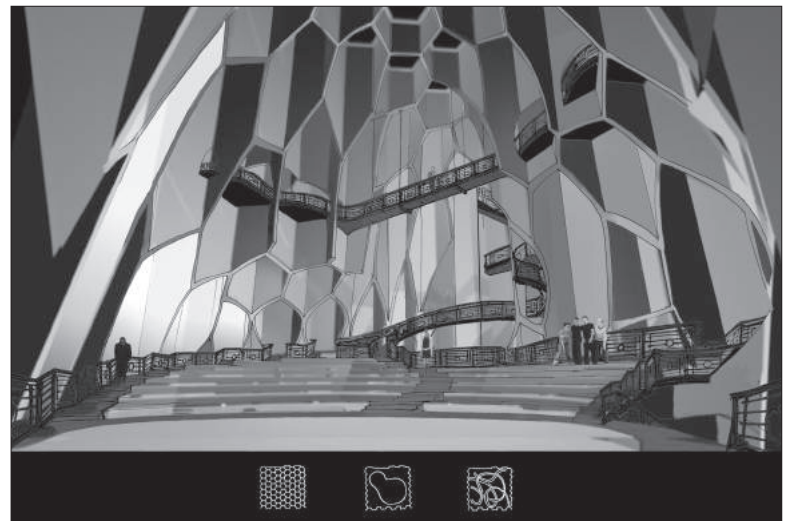
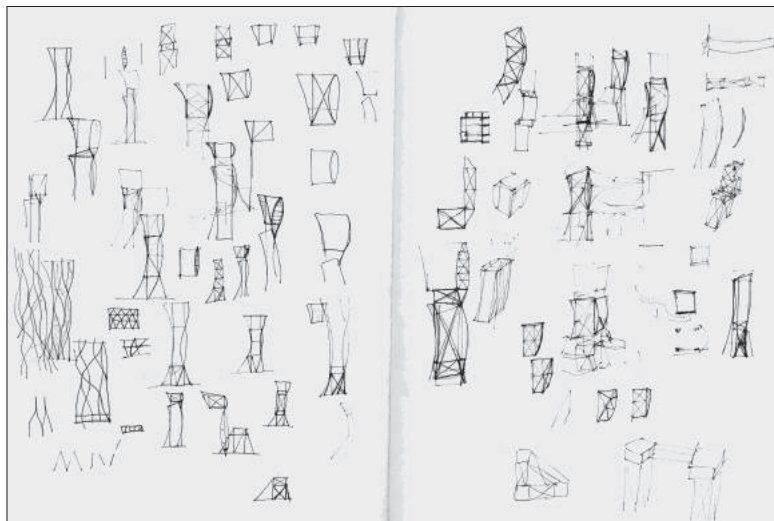
The final stage is all about testing in order to allow architecture to emerge. All vague hypotheses and conclusions are being built and tried out. Marten worked with models on two scale levels, 3D computer models and day-light studies of the weird façade that should make for a Chinese sky-line with three slender towers like fighting Chinese dragons on the building; in order to understand them he made experiments, scale 1: 1, of design, like railings and details.

During this stage the model is important, for sculpturing, in order to get the programme into one's hands. This stage is about synthesis, the integration of all aspects. You should look at the model on your knees; the architecture must become sensual and physical, getting dirty hands, enjoyment. You must really look, get the design out of the world of thought, making it more erotic, more beautiful with your imagination. In this, Marten was a champion.

This stage is important as a prevention of the snugness for which designers are often known. Students usually postpone this stage until the week before the presentation. However, in this stage the plan is ripening, the design is born, then it is becoming great fun. This stage is the true architectural act really. It is partying on many scale levels with very many media.

The final result had many layers, a construction in concrete, Chinese culture, an erotic layer. Following that, you must go back again to the point of departure for a presentation of the first water and a very precise documentation of what you have found out and what the results are. I recognise all this in my own work. The final stage is the nicest. You say good-bye to your pre-occupations. During this stage the project is born. It is a holistic utopia.

Each process is different, but stage VII is characterising my work. My lectures are also used often. A speaker, a performer should make a story an interesting one; that 'interesting' is the design incident, is what makes a design convincing. At Delft University this emotional side of designing has been obliterated completely. The analysis is coming later, but is also ingrained in my pragmatic nature as an engineer.



46 DESIGNING AN OFFICE

JAN BROUWER
JOB VAN ELDIJK
LENNEKE VAN KAN

46.1 INTRODUCTION

This is the report of a design process of Jan Brouwer. The report describes the design for the Water Board Rijnland in the city of Leiden. Each illustration indicates an important step in the design process.

My design process starts with reading the programme of requirements. I am just making notes, no little sketches. Next, there's a half-day visit to the location. Then I determine at quite an early stage the smallest modular unit of the building, in this case the size of an office unit. This happens schematically; without knowing the context well. With this knowledge I make the first little sketch.

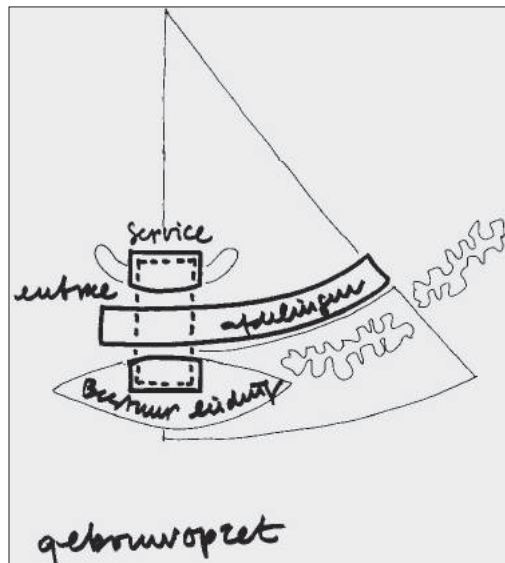
In the present case the programme proved to be simple. A clear tri-partition of the Water Board came to the fore: Directorate, Departments and Services. It entailed an office space accommodating 350 employees and further functions such as a large formal and representative conference space, an archive with maps, an office restaurant, a small laboratory for the restoration of historically important maps, a library, a printing shop and an office for mail.

Important points of departure for the design included:

- Adjusting the design to the location
- The metaphor of the Gate to Leiden. The Water Board is an important governmental institute that should occupy an important place. The building lot is positioned on a characteristic spot on the main road into the city. Through this, the idea of a Gate emerged.
- Sustainability seen from material and method, looking for different sources of energy than the usual ones.
- A climate façade.

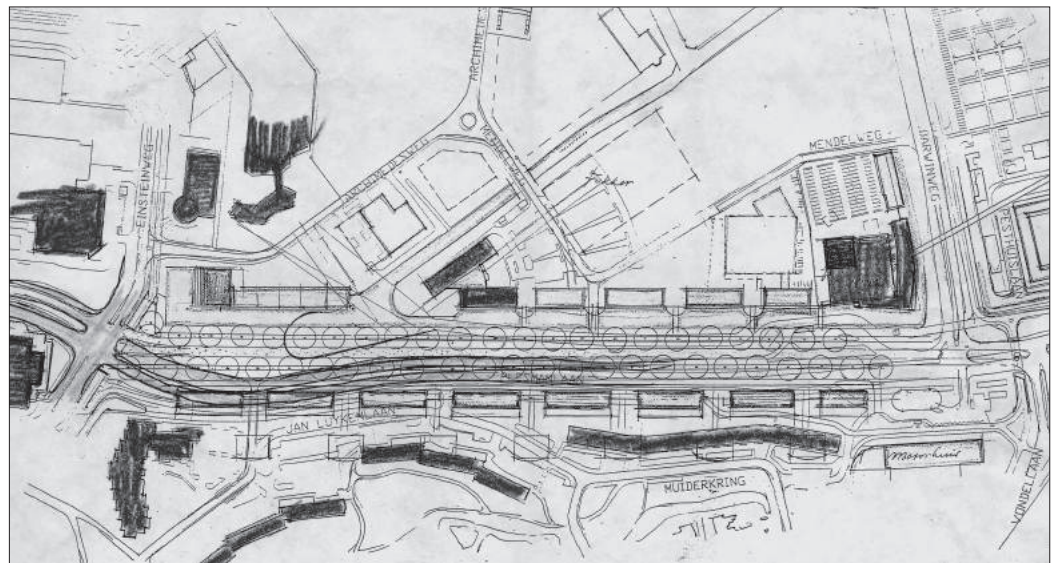
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46.2 DESIGN PROCESS



421 Concept

This drawing shows the first idea occurring to me after reading the programme of requirements. The building is partitioned into three parts: the Directorate along the road, the office rooms in the middle and services in the third part.



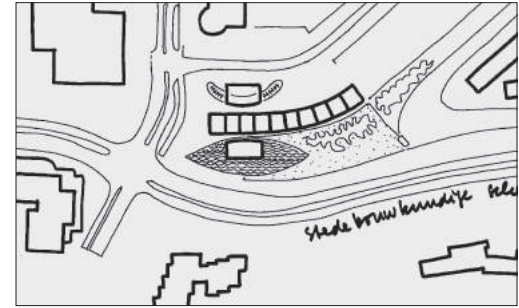
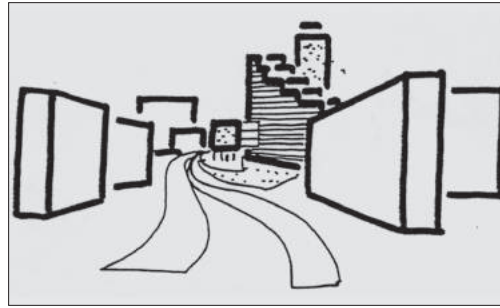
422 Avenue

The Urban Office of the city of Leiden wanted to straighten a curved road into a straight avenue. I proposed a different urban plan preserving the curve.



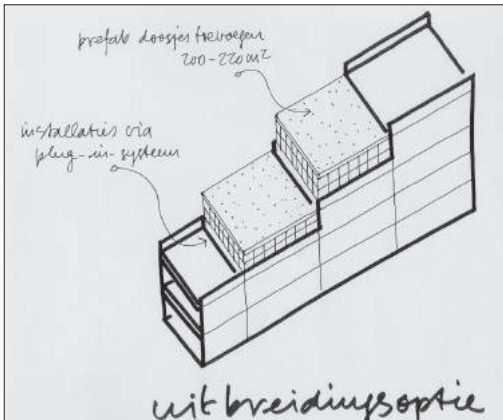
423 Curved Avenue

The illustrations show the motor-road to the new building from two sides. The curve is creating a certain tension. Loss of the curve would entail in my opinion an impoverishment. And what is more: by making a straight avenue there would not be sufficient space left for the building itself on the lot. (Zoning constrictions as to height also applied.)



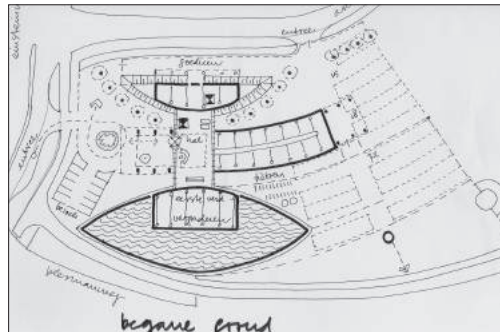
424 Form

The form of the building is studied with the help of an analysis of the context in terms of urban architecture. Ideas emerging due to the analysis of the location: first, the building can be experienced as a gate to Leiden; second, the building should follow the curve of the road.



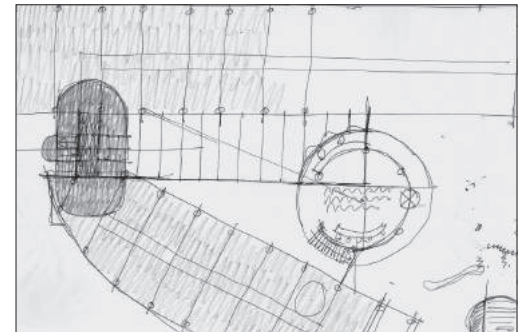
425 Option for extension

One of the requirements put to the building prescribed that extending it would be a possibility. By applying a form in steps parts may be added to the building without causing a significant visual change.

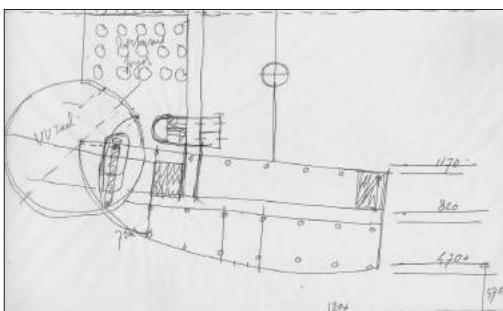


426 Structural lay-out

At an early stage the alignment and size of the structural layout were already determined. For the direction the east – west parallel to the road was chosen and the size was derived from the sizing of a 'standard' office module.

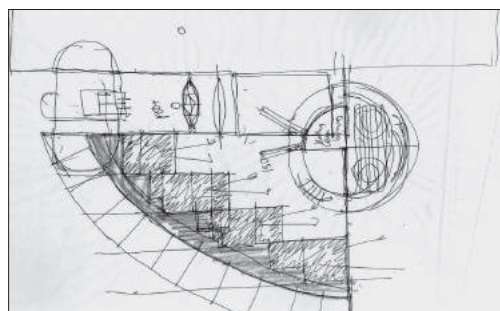


427 Study: office wings curved, circular conference room, central staircase.



428 Same study; but staircase and CC room (Combined Conference, the 'parliament' of the Water Board) shifted.

It became clear in each study sketch that the walks within the building would end up being too long. That necessitated a change of concept: from the tri-partition of the building to a separation in two for the offices. This would also fit well in the structure of the institute, since there are two large departments, one for financial and administrative affairs and a technical department. These three sketches (figure 374-376) are representing the study of the form of both parts of the building and of their positioning vis-à-vis one another.

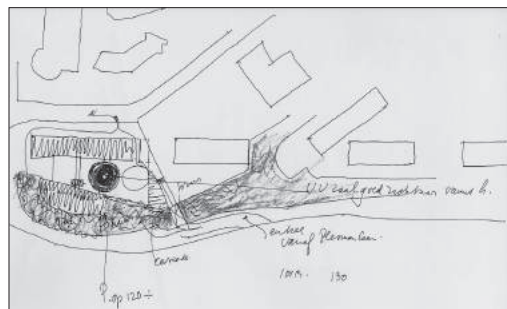


429 Study office wing south.



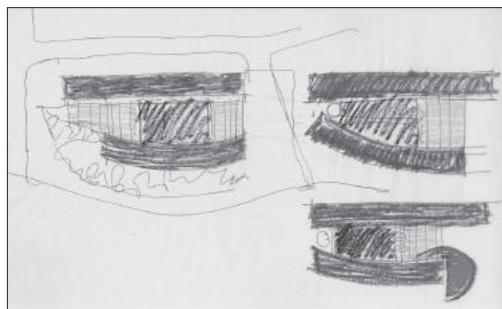
430 Several test models

The forms of the two parts were tested with the help of models. It was studied in which way this idea could be placed on the location. The two parts were called pencil and banana. Bi-secting the organisation proved not to co-incide with the wishes of the departments, there was a wish to be able to extend if need be. Between banana and pencil, bridges proved to be needed.



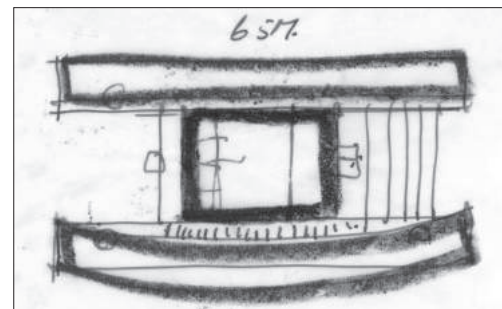
431 Edges sharpened

Important lines-of-view are sharpened. The idea of the gate function is further developed and the positioning in the water became an important point of departure.

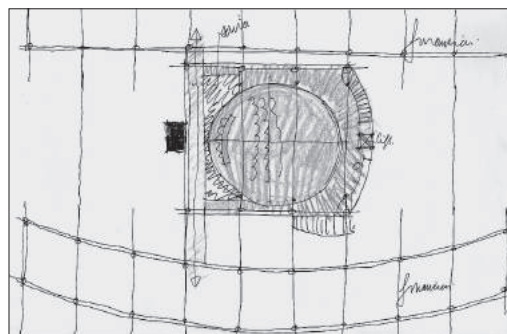


432 Cutting the banana

The form of the banana and the pencil still were changed. Since I considered the gate function to be very important, I did not change that anymore.

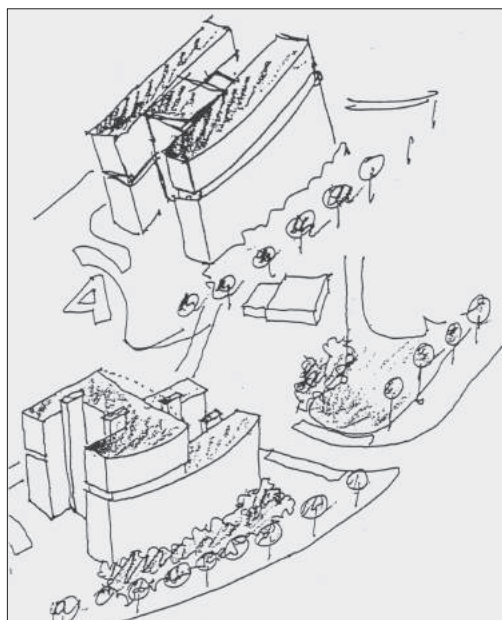


433 Orientation banana – pencil in parallel



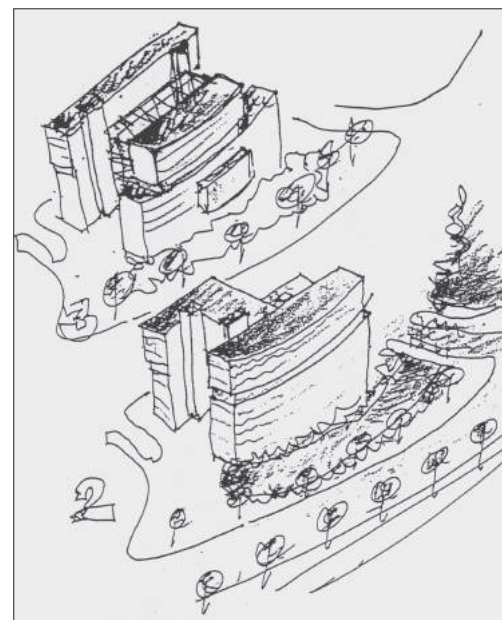
434 Determining module size carrying construction offices

The sizing of the module was already fixed in the beginning. I fixed the size of the room module on 1.80 m. The façade articulation would get the same size and the structural module size would become 7.20 m. (4 x 1.80)



435 Connecting banana & pencil

These are sketches of several solutions for connecting the banana and the pencil, while retaining the idea of a gate function to Leiden.



436 Design of the façade

The design of the façade is a story in its own right. Optimising the quantity of daylight into the office spaces was an important point of departure. That is the source of the idea of a lighting-window and a viewing-window. The lighting-window is a separate, high window seeing to it that extra light is penetrating deeply into the office room. This economises on the energy bill for artificial lighting.

46.3 LOOKING BACK

Acquisition of the commission

The project was a European contract. Some 30 – 35 architects competed. The demands were quite high. Ten architects qualified themselves. Five of them were excluded by balloting, while the remaining five had to describe on one sheet A3 how they would proceed and what their wages would be. Our sheet A3 doubted the need for a new building rather than presenting a new design. That must have drawn attention.

Vital constraint

Crucial was my personal sustainability doctrine, thus making this commission interesting.

Golden moment

Never. Designing is a perennial battle. However there were some decisive ideas; such as the strengthening of the tri-partition of the organisation and the banana-pencil concept.

Dead ends

There were many dead ends, on all parts, like in the façades and the positioning of the stairs. It is important to find the right trail. Sometimes you have to take a few steps back in order to get along later.

Additional requirements for the building

An additional requirement stemmed from myself. It was the choice of as many pre-fabricated components as possible, given their sustainability.

How long is the design indeterminate?

Already during the preliminary design I draw 1 : 5 principal details. There is very little that I leave indeterminate. From the very beginning I have the feeling that things must be produced in a proper way.

Working method

I do not work methodologically, I am sorry to say; for there are many good things to be said for Architectural Design Management.

Impact of budget

In this project the budget was not very influential. It became clear during contracting that a million guilders had to be saved. Following that, some elements had to be left out; like a pergola and sun-shades and less sophisticated types of material were used.

Meeting with the constructor

The builder was not used to the unconventional techniques we proposed, like inter-leaving concrete floors rather than laying an additional covering floor, using granulated concrete and isolation with cellulose. He was persuaded by studies and examples.

Great transformation

A great transformation during the design process was the separation of the offices into two wings. For this there were arguments in terms of the urban context as well as the fact the physical relations in the building would become too long.

47 DESIGNING A VILLAGE

JAN HEELING
JOB VAN ELDIJK
LENNEKE VAN KAN

47.1 INTRODUCTION

This is a report of a design process of Jan Heeling for the extension of the Frisian village Wolvega. Each illustration indicates a step in the design process.

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The first two illustrations are maps of the area. From the third up to and including the fifteenth drawing we are reporting a brain-storm session with some five colleagues in one day. They were made with greasy chalk on sketching paper on a roll. Each time they were super-imposed on the maps of figure 443 and 444. Each part of the area was studied separately; eventually the parts were joined together. Next, the whole could be further processed.

47.2 DESIGN PROCESS



443 Map analysis

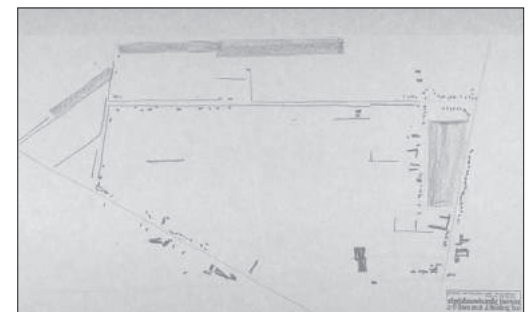
I commenced with an analysis of the map, not with a visit to the location. The map can yield a wealth of information.

Wolvega is built on a ridge of sand; it is bordered by a railway and a road to the city of Leeuwarden. The village may be partitioned roughly into squares. A square consisted in pasture on which something could be built. This is the part at the other side of the railway. Some 900 homes were being planned.



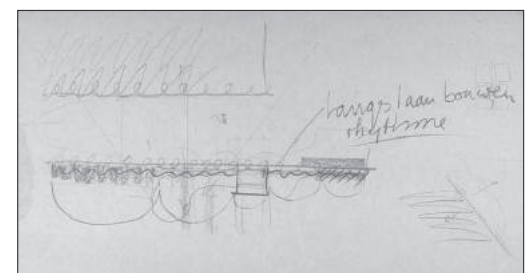
444 Built and unbuilt

Study of the built typologies. In black and white it is indicated what is built and what is not. On this map it may be seen from which period in history a building is resulting.



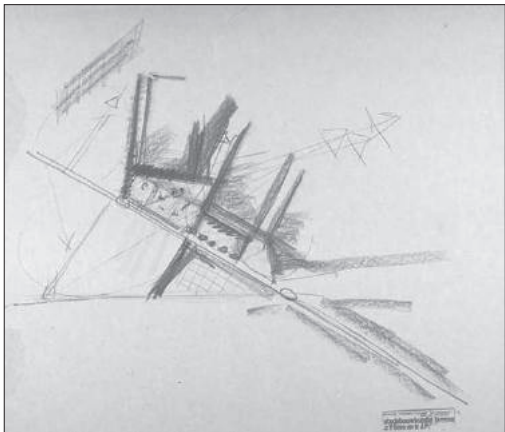
445 Essence

Exploration sketch of the edges and the main lines. In this sketch I attempted to clarify the essence of the area. The inner area is empty. Starting from the area there is no reason to start with a particular form. I have to invent ordering concepts myself to give form to the design. Designing has always ordering and forming at its core.



446 Eastern border

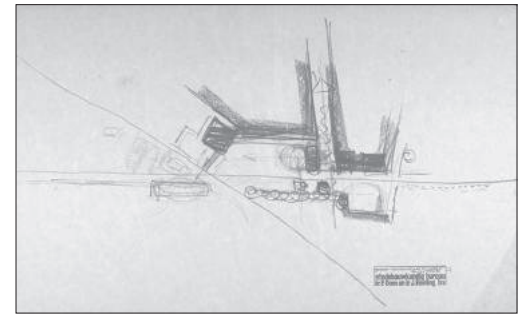
The eastern border has been drawn here. I did not want to consider this a closed afterside of the neighbourhood, but a transparent layer that may be crossed, a rhythm of open and closed.



447 Northern border

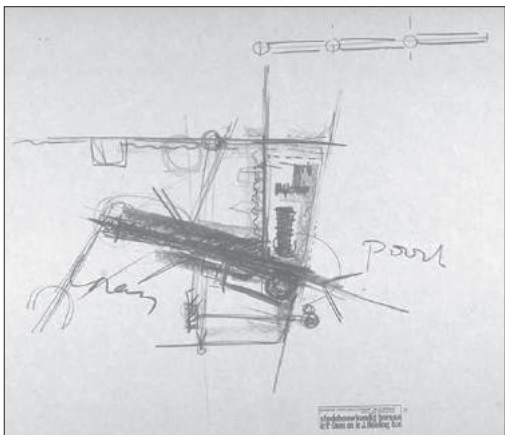
The northern border is the road to Leeuwarden. In it, I wanted to introduce an articulation with vistas through the built environment, departing from existing opportunities (farmhouses, etc.). In my opinion it is important that it is possible to estimate depth, while making one's entrance into a neighbourhood. In order to connect pasture and meadows to the old centre I want to work with increasing density coming closer to it. It is, really, a new entrance to Wolvega.

The western border is the railway. The noise requirements saw to it that a large area should remain empty; tennis fields provided a solution.



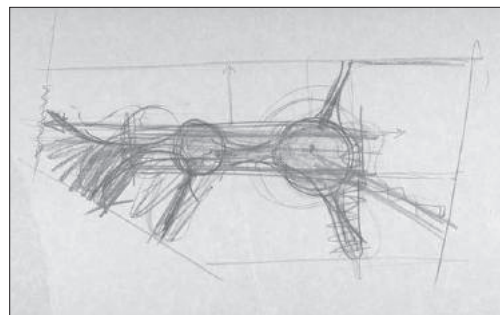
448 Western border

On the southern border there was an area with a factory. In addition, on this side is the main entrance to the surroundings as seen from the village and vice-versa. I wanted to emphasise this by a gate and a lane, leading deep into the new segment of the village.



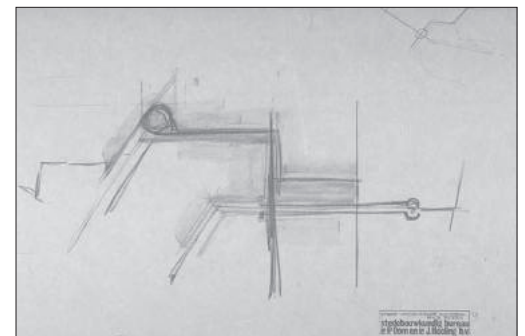
449 Southern border

At this side I planned the entrance to the area. There could come a gate and a long road leading deep into it.



450 Inner area

The edges have now been determined. Next in turn is the inner area. Given the shortage of factors leading to forms, I started to work from the outside to the inside. There is space for two public squares in the area that might give structure to the connections in the inner area. Up to now, these are all imaginings. I do not deal with political or social considerations in my design; my designs are lacking an ideological bias.



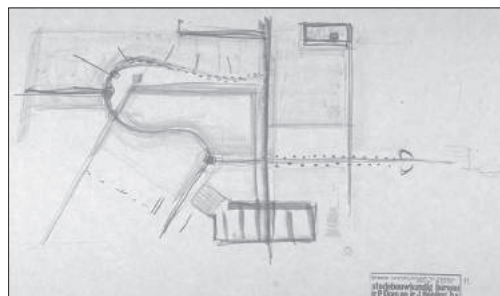
451 Combining

In this drawing, separate ideas are connected to one another for the first time.



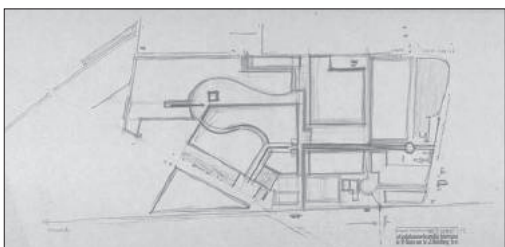
452 Curved form

In the inner area a curved form has been employed.



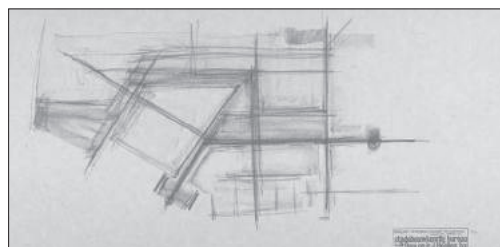
453 Bits and pieces

This drawing represents a study of the inter-dependence between the various design ideas. We came to the conclusion that it was largely an affair of bits and pieces. There was no unity, no sense of conviction. The feeling of the compositions was just no good; so we had to start one more time.



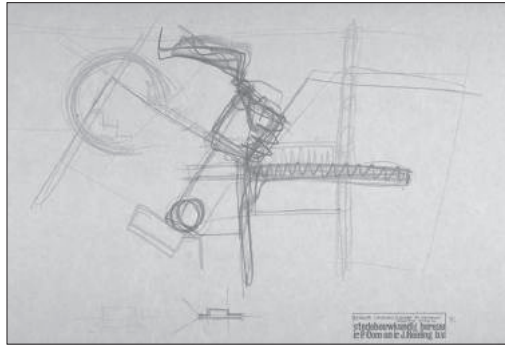
454 Development

The development of the bad idea. This drawing demonstrates the cleavage in the area.



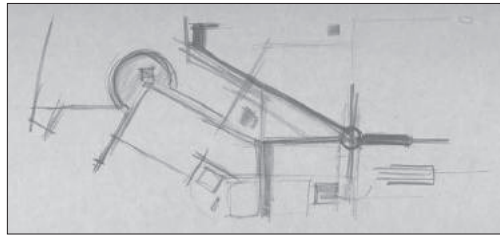
455 Wedge

We tried various strategies out in order to solve the problem of the angular twist present in the orthogonal system of the area causing the lack of coherence: a search for formal coherence. In this drawing the form of a wedge was used for solving the problem of the angular twist. Now the composition felt alright, but a triangle in the centre is just falling unluckily.



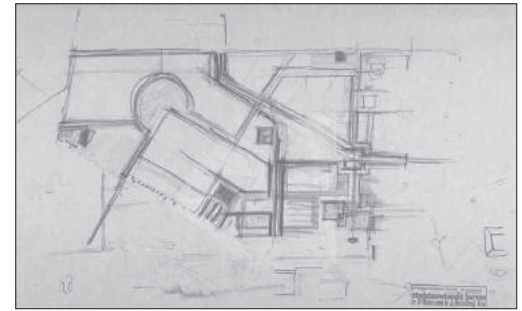
456 Circle

The situation became desperate. A circle drawn at random proved to be the final solution. Clearly, this is not a concept on an ideological basis, only employed because of formal aspects. A different form could have emerged just as well.



457 Beak

Now a form has emerged resembling a beak opening itself.



458 Development

The solution developed.



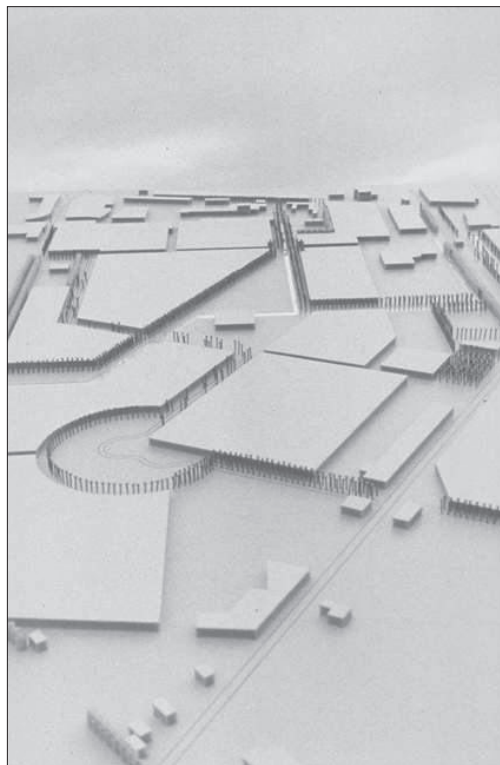
459 Check your watches

The next day we 'checked our watches' for the idea. This was also suggested by the guidelines of the municipality. This is the blueprint.



460 Context

Within the context. For each space we studied the cross-section.



461 Model

A model to give an impression of the spaciousness; this model was presented as well.



462 Adjustment

Adjustment to the existing situation, in order to study the effect.

47.3 LOOKING BACK

How did you get the commission?

A partner in my Office, Mr. Oom, advised the municipality of Wolvega.

What did you do first?

I started with an analysis of the map. I made the conscious decision not to visit the location. I have noticed that those who do are just using some 10% of the material assembled. Except for thinking this to be rather inefficient, I do believe that you look during such a first visit with tourist eyes and that you do not see what is relevant.

What was a decisive constraint?

Requirements were few; the location and the number of homes, 900, were the only ones. The rest you had to find out by yourself.

Did a requirement exist that had nothing to do with the concept?

The concept was not so rigid that new elements encountered generated disturbance.

What was the golden moment?

Finding the circle.

What was a dead end?

The stage before the circle, when unity was lacking in the plan.

What was the rôle the budget played?

A small rôle. On the basis of the bye-laws we made an estimate; it influenced the design but a little. When I was making this design the relation between the designer and the commissioner was different than it is now. One gets acquainted.

For how long continued the stage of indeterminacy?

For a very long time; that has been the nature of the profession. In my designs my determining extends to the lines of private and public properties, central lines of the infrastructure and remaining structuring of public space. The remainder is staying open.

Are you working methodologically?

Yes.

What materials are you using while designing?

In the beginning with chalk and sketching paper, later the computer.

The subject of this Chapter is the development of urban design following design methods: design methods specifically addressing the design problems manifesting themselves in a design in urban architecture. Before focusing on the methods themselves some consideration is devoted to what a design in urban architecture is and what the elements are of a design in urban architecture.

A design in urbanism is understood to be a spatial proposal comprising a number of usually multi-functional projects and a system of public spaces for an urban area, like the inner city or its important parts, areas of re-structuring – harbours, railway emplacements, industrial areas – entire residential neighbourhoods and industrial locations. Making large buildings fit their environment or articulating the site for residential complexes is part of a design in urban architecture.^a

48.1 URBAN DESIGN

Urbanism is more than just designing (the making of plans for building in cities). Planning and technology play a significant rôle as well. In the book *'Stedebouwkundige Ontwerpmethoden'*^b urbanism is divided into three segments with different methods for each of them. The first addresses the functional-technical segment. Rittel and Webber^c call it 'tame-problems': that is to say problems with clear explanations and viable solutions. 'Functional' relates then to the spatial consequences of the programme (destination, density, mutual relations of the destinations, etc.), while 'technical' relates to the potential for execution (site preparation, roads, sewage, bridges, etc.).

The second segment has to do with the making of plans (the process) and addresses decision making, participation and feasibility (practicability). In that case evaluation of the plan on financial, social, legal and environmental technical feasibility is addressed. Rittel and Webber call it 'wicked-problems': that is to say socio-political problems, lacking generally consensus in a pluralistic society. This consensus should still be attained for each plan.

The third segment relates to the content of an urban architectural plan and the way in which its content comes into being (designing / ordering). The methods available for this third segment are the subject of this Chapter; those for the remaining two will not be discussed here.^d

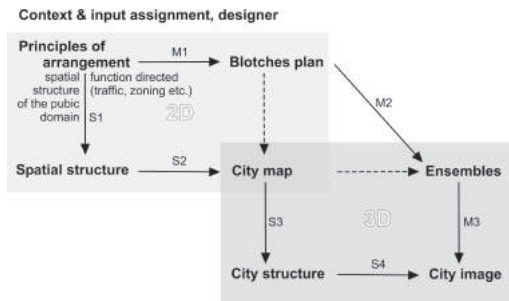
48.2 DESIGN IN URBAN ARCHITECTURE

According to Heeling^e designing = planning + establishing form. However, ordering is also viable without establishing form. In that case functional ordering, plans for spatial ordering, is the topic. With a functional planning the way in which the programme is allocated to the location stands central. Planning insolubly linked to establishing form, that is designing, leads to a formal ordering: a design (in urbanism). As mentioned, the content stands central here; that is to say, what are the components discerned, and how are these components assembled into a spatial composition? 'Components' are understood here to be the means of design in urban architecture, like site articulations, the closed building block, building in lengths. Not only the means of design chosen are important in a design, but also the way in which these means have been put together. Generally a (form) concept is used to get to such a formal ordering.

A form concept is understood to be a consistent package of design ideas containing the main structure of a design. The form concept used is influenced to an important degree by the specific properties of the situation; as well as the way in which the programme requested is spatially translated in the various means of design and the inter-connections resulting from this (functional ordering). Next to the means of design employed, the form concept

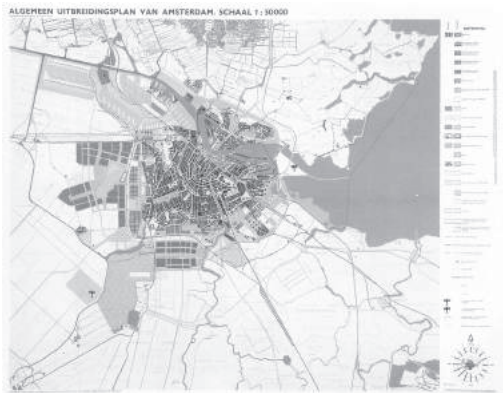
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a Boer, N.A. de (1984) *Architectuur -Stedenbouw, over tweespalt in een vakgebied.*
 b Westrik, J.A. and H. Büchi (1989) *Stedebouwkundige ontwerpmethoden.*
 c Rittel, H. and M. Webber (1971) *Dilemma's in a general theory of planning.*
 d Westrik, J.A. and H. Büchi (1989) p. 41-50.
 e Heeling, J. (2001) *Een zoektocht naar de grondslagen van de Stedebouwkunde.*



463 According to the M-line (M1-M2-M3) the map of the city needs no designing, but comes into being as resulting.

- S1 = dimensioning and establishing the form of the network in the two-dimensional plane
- S2 = organising the location (programme of the network and programme of the building commission)
- S3 = design of the public space + formulation of rules for building
- S4 = the use within the urban structure determines the urban image
- M1 = urban functions allocation on basis of the programme (for network and building commission)
- M3 = the use within ensembles determines the urban image



464 AUP: General Expansion Plan Amsterdam; Map A, survey of all types of usage

and the spatial translation of the programme the way in which the individual properties of the situation have been assimilated in the design in urban architecture is important.

Finally, it should be noted that the content of a design in urban architecture is often built in several design levels, where each level meets its specific design problems. They must be solved with different kinds of means of design. Fitting together the various levels of design to one design is an essence of design in urbanism. Ultimately, if a design in urbanism is involved, a designed urban image emerges. This Chapter addresses the specific rôle of urbanism and the design methods employed. The design products requested may shape this rôle. Three possibilities, where the urban architectural plan is employed in three different ways, leading to an urban image are discussed here.

48.3 FUNCTIONAL PLANNING

The urban image can be designed by a functional planning ('blotches' plan) made by the urbanist, followed by specific designs for blotches in various architectonic ensembles. The map of the city is not designed, but results as it were (in figure 463 the M-line). This procedure is characteristic for the urbanism of the functionalists. A memorable example of this urban architecture is the AUP. of Amsterdam by van Eesteren.

In The Netherlands legislation for spatial ordering – WRO – pre-supposes this way of thinking with for planning instruments the global plan of destination ('blotches' plan), structure plan and regional plan Expressing the programme in terms of destinations plays a main rôle and generally results in separate spatial units based on the programme to be realised.

48.3 STRUCTURAL DESIGN

The second possibility, structural design, recently put into words by Heeling, distinguishes for the urban design four themes, to wit:

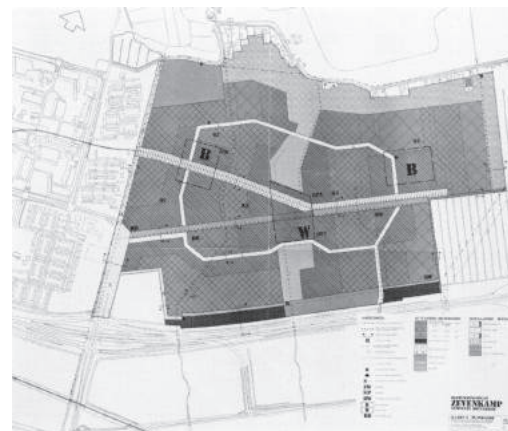
- the spatial functional organisation of the city;
- the design of the urban ground plan;
- the design and filling-in of public space;
- the rules for building.

This possibility acknowledges the autonomous position of the designer in urban architecture and provides to him/ her an conditioning position in the origination of the urban image, particularly by introducing the design of the map of the city as an independent design product. The spatial functional organisation (programme utilisation) is implicitly assimilated in the design of the groundplan of the city.

The design and filling-in of public space is the next step of the design of the ground plan of the city. It is the subsequent working-out of the system of public spaces establishing the network of the groundplan of the city.

465 'Blotches' plan

466 Grachtengordel Amsterdam, de Amstel^a



^a Duncan, F., L. Glass et al. (1993) *Amsterdam: the comprehensive street-by-street guide with bird's-eye-view mapping.*

The rules for constructing and building are the conditions put to the buildings to be designed by the groundplan of the city; the architectonic tasks. The girdle of the Amsterdam canals provides a historical example of this way of thinking. A recent example is the urban design for the Java island in the Eastern harbour area in Amsterdam. This way of thinking pre-supposes an open system in which the boundaries of the task are generated by the situation, or lacking in the whole.

48.5 THE DESIGN OF THE URBAN IMAGE.

At the third possibility the urban image is designed directly in its entirety. The design is a mix of city building and architecture (architecture of the city). Generally the architect takes the part of urban design into account. The building designed (the architectonic unity) is also the urban unity. Berlage's 'Plan-Zuid' for Amsterdam is a historical example of this case. Recent examples include the designs by Coenen for the 'C ramique' site, Maastricht, and by Bhalotra for the 'Kattenbroek' neighbourhood in Amersfoort. Also in these cases the design has been designed as a separate unity, its image included.

As befits this age, combinations of these three possibilities manifest themselves, termed 'hybrid' in contemporary parlance.^a The urban architectural plan for Borneo-Sporenburg, in which the urban building blocks have been designed directly as an image and the 'strips' for urban units of the urban groundplan is an example; another is the urban design Ypenburg, in which on one side a design for the ground plan of the city (the frame-work) is made for the entire area and on the other side for each field a separate further detailing.

The question emerges on what grounds this kind of motifs among the three possibilities is used. In this Chapter it suffices to state that the task as commissioned, as well as the design concept of the designer, might provide a motif for selecting one out of three possibilities.

48.6 THE URBAN TASK

The commissioner not only formulates the commission, but also determines who is going to make the plan. The commission generally comprises: a programme, boundaries to the plan, and limits to the plan, as well as the design product to be expected. This means that the commissioner for whatever reason (flexibility, size of the planning area, real estate property, staging in time) influences implicitly which possibility – out of three – will be applied. The size of the planning area plays an important r le in this, as well as the dominance of the next higher level of scale: what elements are almost pre-supposed, such as matching main thoroughfares, ecological main structure, etc. The various levels of scale as they have been integrated into an integral design commission – for instance the 'Zuid-as' in Amsterdam – also imports. All these factors influence the design product to be delivered. Finally it may be the designer himself/ herself who applies one of the possibilities.

48.7 FUNCTION OF THE URBAN DESIGN

In the previous paragraph it was explained that the commissioner has great influence on the design process. In this it is of eminent importance for which purpose the design is made. A design in urbanism is mainly used in favour of a plan of spatial planning, in the case of the Netherlands based spatial planning regulation (destination plan and structure plan).

Under such conditions urbanism finds itself caught between two poles: the one determined by planning, procedures, decision making and processes to be governed; the other by a discipline of designing still akin to architecture.^b Van der Voort thinks that the practice of contemporary building of cities in his country is increasingly making use of types of planning, regardless of Legislation and the Decision as to spatial planning: urban plans, master plans, like, for instance, the plan for the 'Kop van Zuid', Rotterdam, or the one for IJburg, Amsterdam.^c



467 Aerial photograph of 'Plan-Zuid', eastern part, Amsterdam



468 IJburg

a Meyer, H. (2000) 'Hybridisatie' van stedelijke gebieden.
 b Vink, H. (1980) *Geen stedenbouw zonder architectuur*.
 c Voort, R.Th. van der (1988) *Stedenbouw in de jaren '80, ruimtelijke kwaliteit onderzocht*.

This kind of ‘planning figures’ is required in order to distinguish neatly from one another, as they are, spatial qualities like elements determining structure; such as articulations of surfaces, types of buildings, rise of them, as well as the system of public spaces linked to situative, programmatic, (civil)technical and financial boundary conditions. Urban design has become, in cases like these, an autonomous product, used in order to influence public opinion and mobilise financial resources. Next to a planning function, the design of urbanism has come to embody a communicative function. Meyer and Reyndorp^a remark, that this type of design does not result, in the strict sense of the word, in urban plans; and certainly not in those with the legislative nature associated with them until recently: more likely than not ideas, speaking to the imagination, creating the possibilities for an era dedicated to a ‘New Urbanity’. Also, the frequently occurring pluriform urban architectural commissions^b envisage to draw attention to certain urban areas and to indicate which future developments are possible through spatial proposals and which contribution to the urban image as a whole is provided. It results in a situation in which the urban design is severed from spatial planning.

This severing serves to give the design next to its communicative function a studying function as well.^c This study focuses on the consequences of the design decisions taken. They determine the content of a design in urbanism. They include in any case the means of design previously mentioned, like the elements determining structure, site articulations and the system of public spaces, but also study by design, interested in the consistency of the design, the (form) concept employed and the characteristics of the situation itself, as well as the position of the situation in the urban area surrounding it. This study by design is a type of study that differs greatly from the study performed in the ‘plan’ function of a design (design study); under those circumstances the study of programmatic and technical possibilities and financial and political feasibility gets more emphasis. In addition this study by design may be focused on the designing process and the design methods possibly employed.

48.8 DESIGN METHODS

This paragraph deals with methods determining the content of a design in urbanism, or influencing it. Büchi and Westrik describe nine design methods and a number of aspects determining content, to wit: the spatial translation and ordering of the programme (functional planning); the interpretation of the present situation serving the design; the design components chosen; as well as the form concept used (the formal ordering). The way in which the functional planning is allocated in the formal design plays an important rôle.

48.9 THE NEED FOR DESIGN METHODS IN URBANISM

The need to study design methods in urbanism is derived from an effort to make private thinking and acting of people associated with architectural design, especially designers of urban architecture, public. The use of design methods sees to it that the urban designs developed this way can be readily studied and discussed. The use of design methods also favours transfer, clarity and verification of designs. In addition, Jones thinks that the beneficial effects of the use of the design methods described earlier include that the designers are obliged to look beyond their immediate need for apparently relevant information and to suppress the inclination to adopt and cuddle the first idea surfacing.^d In addition to these arguments pleading the case for the use of design methods the following ones could be mentioned:

- the use of design methods contributes to systematic design and process;
- since it is known beforehand which steps and design elements will be used;
- applying design methods enables and favours co-operation between those who face together the task of finding spatial solutions;
- applying design methods necessitates study by design: this may focus on the design itself, as well as on the further development of the design method;

a Meyer, H. and A. Reyndorp (1988) *Stedenbouwkunde, een nieuwe stedelijkheid*.

b Heeling, J. (1988) *Meervoudige opdrachten kritisch beschouwd*.

c Pasveer, E. (1988) *Planvorming Kop van Zuid te Rotterdam*.

d Jones, J.C. (1970) *Design methods: seeds of human futures*.

- applying design methods leads to a consistent (balanced) design of urbanism;
- the use of design methods enables the development of a design in which the link between well-formulated points of departure and the spatial solutions is rendered as clearly as possible.

48.10 WHAT IS A (DESIGN) METHOD?

A method is a fixed way of acting, well thought out, in order to attain a certain aim.^a Methods are systemic procedures to attain formulated aims, means to deal with a certain type of problem with a certain degree of success. Methods reflect experience assimilated in the past. A method is not the specific knowledge of an individual, but may be shared and applied by others.^b

Design methods in urbanism are methods regarding the content of a design in urbanism; that is to say: design elements and the way in which, with these elements, a design in urbanism is developed. In the development of urban architectural plans, other groups than this design group are used. These methods may indirectly influence a design in urbanism; however they have not been developed especially for determining the content.

Design methods do not just reflect past experience, but might as well be based on the results of a study by design. The design of urbanism and the design method, in their mutually relating, are then the object of study; as there are typological/ morphological studies; studies of (form) concepts; spatial structures, urban images and the process underlying a design.

48.11 APPLYING A DESIGN METHOD

A no-nonsense application of design methods is treacherous. De Boer says on employing methods:

“It is just as dangerous to over-value methods as to underestimate, or reject them. A satisfactory urban plan, or more generally, a plan in spatial planning, never results exclusively from the application of method alone. Creativity, and the power to imagine and invent are required; as well as a sense and insight regarding what is social. There is no reason why methods should be a unique blessing; nor why they should be dismissed as an aid.”^c

In order to prevent mindless application of (design) methods some points apply:

- design methods should never be used unless knowledge of underlying thought is taken into account;
- generally a design method can only be used for one aspect of the design problem;
- design methods do not feature a well-defined outline, applicable in any situation; according to the specific design problem one should strive towards an approach befitting the situation;
- employing design methods should not benefit exclusively the position of the user of the method;
- the selection for the application of a specific design method establishes the contours of the design solution. The design method itself does not provide for the creative filling in of these contours;
- applying design methods does not result necessarily in the ‘quality’ of the design;
- the ‘quality’ of a design in urbanism is depending on the insight, knowledge and capability of the designer employing the design method.

48.12 DESIGN METHOD – DESIGN ASSESSMENT

Each and every designer entertains personal ideas and theories concerning design; they influence them greatly. Brandes distinguishes in a study on the filling-in of newly built residential areas the design concepts mentioned into four main streams: functional, experimental, ecological and decisional.^d According to her, the main difference between these streams stems from what is stated in a design primarily, with what ideas the first lines or words have been

a Dale, J.H. van, G. Geerts et al. (1989) *Groot Woordenboek der Nederlandse Taal*, 11e druk.

b Bergman, H. (1978) *Ontwerpmethoden op bestemmingsplanniveau*, p. 78.

c Boer, N.A. de (1982) *Planvorming in de ruimtelijke ordening*.

d Brandes, E. (1980) *De stedenbouwkundige inrichting van nieuwbouwwijken*.

put to paper; what (form) concept has been developed, which means of design have been introduced, and the way in which the existing situation is interpreted. A first idea like that determines the initiation of the design. The way of working, the design process, is strongly influenced by these first thoughts as well. Applying a design method, consciously or not, is part and parcel of specific considerations of a designer. By opting for a deliberately chosen design method affinity with design theory, respectively design concept, underlying the design method is expressed. It may suffice here to mention the underlying thought per method described. No stance is taken *vis-à-vis* the several design concepts/ theories on which the design methods are based.

Westrik and Büchi give a survey, based on some concepts of importance for design in urbanism, how the several design methods are received.^a

Foqué gives insight into the method-theory:

“A method as such is a description by means of language. Inherent in each description is reduction of experience; what is beyond spoken language evades it. A method is not value-free. It produces its very restrictions, influencing this way the result. The underlying value pattern of the method, the so-called theory, is reproduced. In fact, designing is a process of transformation of the facts of life to what is native to design. Continuously, the designer orders facts specifically, particularly according to the possibilities to be able to execute within this ordering his designing activity; starting from his personal design language and addressing it. In practice, order is constructed by itself, and not by theory! The designer will have to state by himself what the operational limits are of the design method used, while any method is a certain, but also limited, way to take a stance vis-à-vis a design problem.”^b

48.13 CONSISTENT DESIGN

‘Consistent’ means here that also those aspects are considered in the design that are not mutually exclusive and do not overlap, but who support and complement one another. The following aspects are concerned:

- a tuning of formal and functional ordering;
- a functional ordering based on a spatial translation of the programme, in which the relations between the various functions have been tuned to one another (opportunity to live and to work, connections and facilities);
- a formal ordering, comprising:
 - a (form) concept, a consistent package of design ideas,
 - an ordering with the means of design employed, and
- the ways in which the existing characteristics of the area have been acknowledged in the design
- tuning and connections between the various levels of the design with their specific design problems;
- the potential for execution within the urban design.^c

In the next three paragraphs design methods are ranked according to their contributions to the three possibilities how a plan in urban architecture can be made: the ‘blotches’ plan, the map of the city and the city image.

48.14 ‘BLOTCHES’ PLAN

In the case of a functional planning the spatial translation of the programme is the central issue. Generally this happens by way of a model-like approach. Lynch^d discerns several kinds of (urban) models; like city shape models, (hierarchical) models of facilities, density models and traffic models. The ‘early’ work of Alexander also departs from a model-like approach in order to achieve a functional ordering.^e From the functional angle it is often tried to head towards a spatial differentiation. Programmatic differentiation is a new development and is

a Westrik, J.A. and H. Büchi (1989) *Stedebouwkundige ontwerpmethoden*.

b Foqué (1976) *Zin en onzin, verslag van 9 gastlezingen aan de afdeling Bouwkunde, TH-Delft*.

c This urban architectural design was never executed as such. The execution is taking place through building plans and installation plans for public space.

d Lynch, K. (1985) *A theory of good city form*, appendix D, p. 453-455

e Alexander, C. (1964) *Notes on the synthesis of form*.

employed, amongst others, in the plan 'Leidsche Rijn' in Utrecht. As mentioned in paragraph 1, rather planning methods than design methods are involved.

De Boer developed a basic site articulation in order to realise an urban image for the blotches in an early stage.^a The same applies for the well-known 'stempel-verkavelingen' applied amongst others in Pendrecht and Frankendael. Presently this kind of blotches like fields are being worked out in an architectonic ensemble (GWL area in Amsterdam)

48.15 THE MAP OF THE CITY

The spatial composition and the design components required for it are the central problem. Allocating the programme within this composition is a related problem. The components are often determined by a typological approach. Types *vis-à-vis* public space are then concerned (standard profiles and islands/ fields of the areas to be built) in which the mutual relation and scaling play an important rôle. Heeling is one of the people asking for attention for this composition problem.^b Marks and Hinse developed a design method for integration of properties of the area, the programme and the composition.^c

In current practice the design of the map of the city often carries the name 'Master Plan' ('Kop van Zuid', Rotterdam, 'Zuid-as' Amsterdam), where the position in the city and accessibility are the most important considerations for the design.

48.16 THE CITY IMAGE

Well-known design methods intending to arrive at an image of the city have been made by designers like Cullen (Townscape)^d and Alexander (Pattern language).^e The city analysis by Lynch (Image of the City)^f has become a classic and is often used as a basis for a design method. In the Dutch situation the 'Pattern method' of the SAR tried to achieve a global (preliminary) image of the city starting from a built space typology. Current practice is aiming at unique images of the city without applying a specific method; for instance the 'Céramique' location in Maastricht (fig 471). The images might be based on metaphors (Bhalotra, Kattenbroek in Amersfoort); on motifs of sustainability and environmental concerns (Duyvesteijn, 'DE Wijk' in Tilburg, see page 313) or by considering the city as a complex of buildings (Koolhaas, centre Almere).

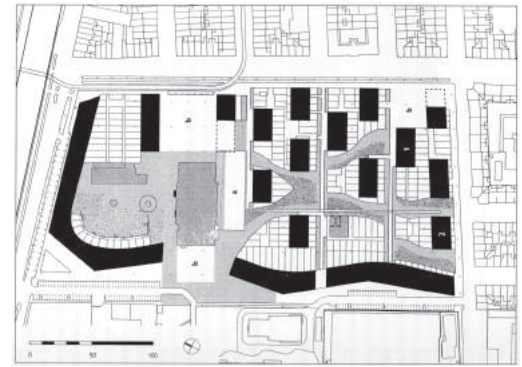
48.17 PRIMACY OF FORM OR FUNCTION

Summarising, a threefold division can be made with regard to the question how methods deal with connectedness:

- methods with an emphasis on formal design: Form concept, Basic Articulations, SAR-pattern method, Method Lynch, Townscape;
- methods solely addressing functional planning: decomposition method
- methods combining the functional and formal design: Environmental differentiation, Three Traces method, Pattern Language

48.18 SYSTEMATIC OF THE PROCESS

The systematic intended here particularly concerns the way in which a consistent design comes into being. In order to systemise the design process one often is basing oneself on the notions model, type and concept. A design method may result from a method of analysis for urban architecture (for instance the method Lynch, Townscape). It can be further developed by design analysis of design made with a method. Per method it can be indicated how and in what sequence the aspects of the preceding paragraph have been tackled.^g Such a design study shows the applicability of design methods in a certain context. Often the method causes a certain systematic or structure in the design process. In what follows it is indicated per design method how the method influences the design process.



469 Surface design West 8 for the GWL area in Amsterdam. Urban plan of the Christiaanse office.



470 Urban Master Plan Kop van Zuid, 1996. City map.



471 Urban Master Plan Sphinx – Céramique site of Jo Coenen, Maastricht, 1987 Map.

a Vliet, K. van (1989) *Systematisch ontwerpen: planvormings experiment in Emmen*.

b Heeling, J. (1989) *Vormconcept*.

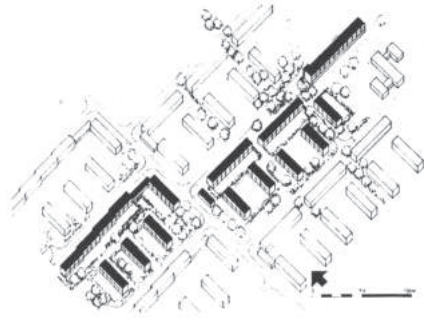
c Hinse, T. and F. Marks (1989) *De drie-sporenmethoden*.

d Cullen, G. (1961) *The concise townscape*. See also: Westrik, J.A. and H. Büchi (1989) *Stedebouwkundige ontwerpmethoden*, p. 259-281.

e Alexander, C. (1977) *A pattern language*. See also: Westrik, J.A. and H. Büchi (1989) p. 283- 307.

f Lynch, K. (1960) *The image of the city*. See also: Westrik, J.A. and H. Büchi (1989) p. 207-236.

g Westrik, J.A. and H. Büchi (1989).



472 Basic allocation method

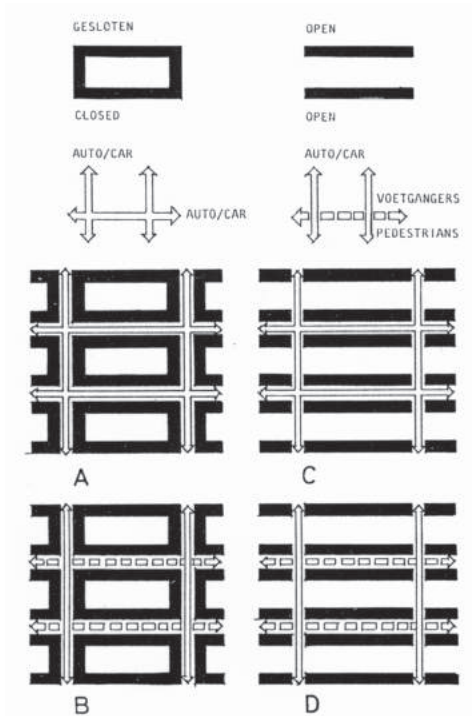
48.19 THE BASIC ALLOCATION METHOD

The basic allocation method puts the quality of living in the first place. For the benefit of a design in urbanism this quality aimed at is expressed in a basic articulation/ prototype. Opting for a basic articulation is always linked to historical time; that is to say to social and situational considerations. It is of importance whether a basic articulation has been developed for an area in the inner city or for an area of extension.

With the help of basic articulations one can be confronted in an early stage by a basic articulation for the entire area (tentative articulation). By this one can react to the situative and programmatic requirements with mutual adjustments in the main structure and the basic articulation. The basic articulation method should be regarded as a typological approach.

48.20 THE SAR-PATTERN METHOD

The SAR-pattern method has also been developed in order to agree in an early stage on the residential environment desired. This method departs from the pattern of the city, the recognisable combination of spaces with and without buildings and the possible margins between both. In contrast to the method 'Basic Articulations', in this method the outside space to be designed stands central in relation to the future building. It has then become possible to observe according to what rules this co-existence has come into being. On the basis of this co-existence further agreements can be made concerning the position and the size of the building and of the space. This is also an instance of a typological approach.



473 The SAR-pattern method

48.21 THE DECOMPOSITION METHOD

Functional inter-dependence is emphasised in the case of the decomposition method. An extra step is needed in the design process to get from a design problem to a design solution because of the increased complexity of the reality. This extra step involves searching for inter-dependent subsets on the basis of criteria previously formulated. Subsequently, these inter-dependent subsets may be translated into constructive diagrams that may serve as constituent elements for the mental picture (the design) of the shape to be developed later; a modelling kind of approach.

48.22 THE THREE-TRACES METHOD

The three-traces method features three design paths. One of them aims at function, one at composition and one at topography. Under topography is understood the whole of the manifold visible and invisible data determining together the structure of the landscape and its future development. Crucial in this design method is that the three paths are developed as autonomously as possible, although synchronously. In all three paths the concept 'pattern' plays a rôle. This dichotomy autonomous – synchronous is chosen in order to link a design process that is as clarifying and controllable as possible to a balanced plan development.

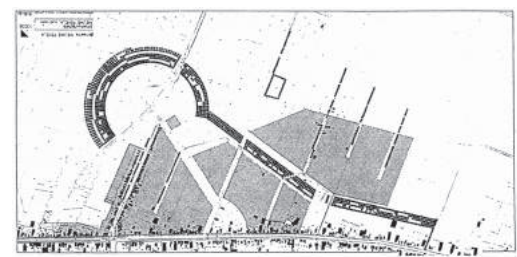
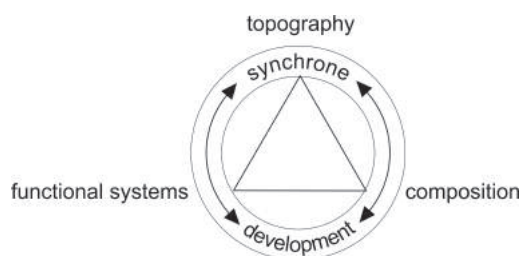
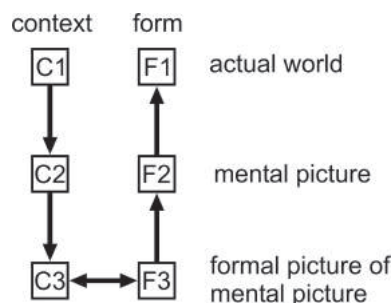
474 The Decomposition Method

475 The three-traces method

476 Form concept

48.23 FORM CONCEPT

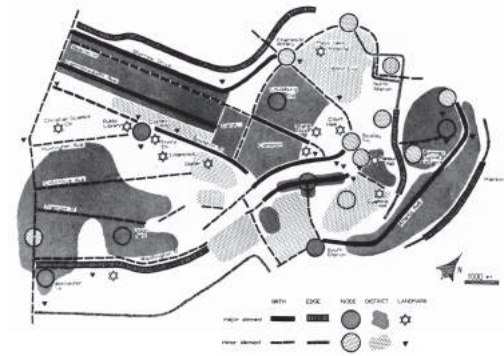
The notion 'form concept' should not be regarded as a method as such, but as a methodological tool to indicate in an early stage of the design process which ideas are decisive for the spatial inter-dependence of a design. A design cannot possibly be thought out in its entirety in one fell sweep. The design problems are too complex for that; a form concept can assist in



dealing with this. The concepts developed differ in each commission and in each situation. Depending on the prevailing points of connection with the existing situation the concept can be based on this to a higher or lower degree. One can also look for points of connection not based on the existing situation, but for other connecting elements, as there are analogies or metaphors.

48.24 THE METHOD LYNCH

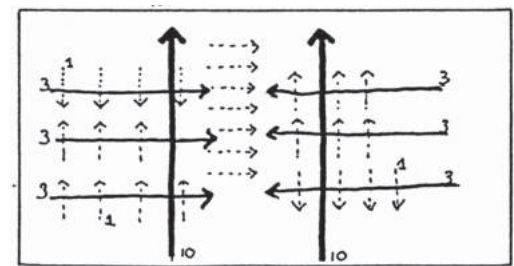
The method Lynch departs from the urban image and the way it is experienced collectively. The spatial quality of that urban image is expressed in the 'legibility' of the city: the ease with which the city may be recognised in its parts and put together by its user to an inter-dependent whole. If the method Lynch is used as a design method, a spatial structure is developed with regard to the design elements determining the urban image: routes, edges, areas, connections and landmarks.



477 The method Lynch

48.25 THE ENVIRONMENT DIFFERENTIATION METHOD

In this case 'structure' is understood to be the hole of distinguishable parts and elements sharing perceptibly an inter-dependence. The notion of structure also plays an important rôle in environment differentiation, but structure is here also seen as an intermediary between form and function (the abstract notion of the spatial reality). Next to the aspects form, function and structure the aspects 'content' (what varies; the variables) and 'intent' (the objectives) are distinguished. A concrete structure exists (the way in which constituent parts make for one area) and an abstract structure (the way in which constituent variables make for a model). Added to these five aspects is a classification in scale levels.



478 Environment differentiation

Each scale level has its own design variables enabling environment differentiation recognition on the level of the residence, but also on the level of the neighbourhood, city, region, or country as a whole. Spatial structuring is especially important in a design: separation of (environmental) variables irreconcilable between one another, and connection of (environmental) variables supporting one another. The structure is then a tool with which a designer influences function and form without determining them. It is the first step in a design process and it has a modelling character.

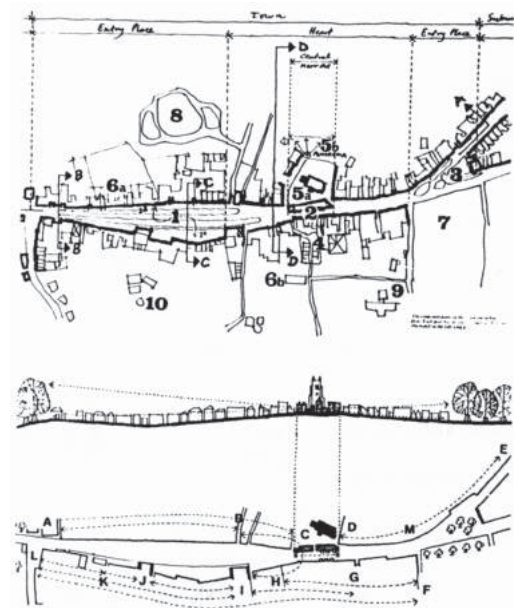
48.26 TOWNSCAPE

Townscape departs from the urban image as a factor generating a plan, but also from the image of the village and the landscape. This results in translation of neutral design schemes in comprehensible three-dimensional environments.

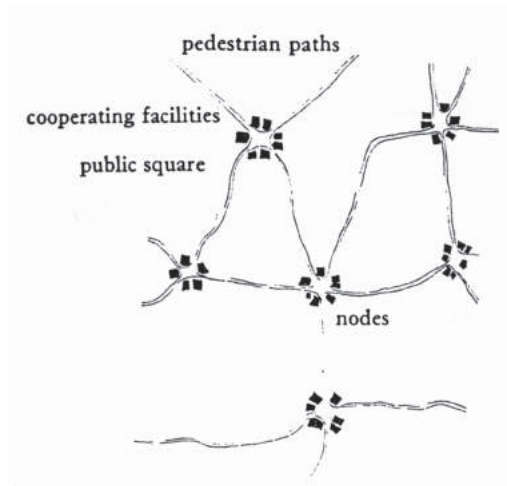
Individual design elements are worked into a composition. According to Cullen, the urban image is experienced by the spectator emotionally in three ways, viz.:

- the sequence of images resulting from movement: 'serial vision'
- the place, experience of the here and now
- the content, the intrinsic quality of the objects of the environment in their context

While analysing and designing urban environments Cullen uses in addition to the points mentioned in the above a frame of communication that can be regarded as a checklist. By translating the notions occurring in this frame (structure, route, space, place, element and orientation) into well-considered design elements, this pre-supposes preceding studying and making explicit the spatial significance of these notions. In this, properties of the situation may serve as guides. The existing situation is made expressive in the putting together of these design elements into a composition. The design elements achieve by their mutually weighed positions in this composition a visualising significance. Emphasising experiential qualities favours communication between the environment and the spectator: a communication can be visualised already during the design process, as a design tool. Drawings in perspective are eminently fit for making the mutual communication comprehensible.



479 Townscape



480 Pattern language

48.27 PATTERN LANGUAGE

Pattern language can be regarded as an instrument, a utensil, a language allowing everybody to design by himself and together with other people. It comprises design directives for cities, neighbourhoods, residences, rooms and also the basic construction of minor building commissions. The elements of the (design) language are the patterns.

A pattern describes a design problem. It indicates essentials of the requirements put to the solution of a problem. A pattern may be applied any number of times without leading necessarily to the same result twice. The relation between the patterns is not linear; between the various levels and within the levels a wealth of connections is possible. A pattern does not lead to a design. However, it indicates in a general and abstract way which essential conditions should be taken into account. The designer must make the design himself, while he / she may / should be guided by personal ideas, experience and by specific local circumstances. Actually, patterns are 'hypothetical' and give an exact number of possible essential properties and processes of and within our environment. Pattern language is a typological approach.

49 DESIGNING IN A DETERMINED CONTEXT

TAEKE DE JONG

Design study, unlike design research, typology, and study by design, is part of the normal practice of architectural firms as well as urban development or technical consultancy firms. In this regard, location, social and material restrictions, the nature of the assignment, and possibly a programme of requirements essentially form the determining factors (context). The object, however, is variable; it has to be designed after all.

This object to be designed does not *causally* stem from the context; if this were the case, one would no longer have to “design” the object, as it would simply be “predicted”. The context only sets the conditions for solutions. There are always very many solutions, even though one does not *see* them before they have been designed. Empirical, generalising research is not sufficient to generate these designs on its own.

In the process of design, one indeed looks for existing examples (precedents, references) for the object (design research, see page 89), and for familiar forms that come up for consideration in this context (typological research, see page 103). Yet copying from an example is rarely sufficient, and a form is by definition not yet a design (model). A form and an existing model of this form may fit into the location and its context, allowing one to decide whether to apply the model (model-based design). In the process of detailing, however, one always runs into a need to make design decisions that were not included in the model.

A compass is always needed that also represents the context, so that one can see the direction that the form can consistently be elaborated in, and the direction in which changes have to be made. This kind of compass or idea, which may be a drawn or schematic picture (pattern or process), which addresses the participating parties, and which may also contain the context and *various types* (concept or better conception)^a, leads to consistency in such decisions and to recognisability amongst participants. A conception has to be designed, but it is not yet a design (model). A conception *generates* design activity and design resources, while a type *structures*. The issue of creativity is, upon this realisation, only transferred from design, model, and form to concept, but it can indeed be nameable in phases. The question remains: “how does one arrive at a concept?”

49.1 TAKING AN INVENTORY OF ‘CONTEXT’

In design study, the context of the object is indeed essentially familiar, but only becomes completely clear during the process of making plans. For this to happen, documents and meetings are necessary. The perception of the context changes with each meeting in the process of making plans, in which parties from the context are involved; they are also involved with every document that comes to the table. Some meetings lead towards clarification and wide-reaching definitions of the context, while others are more likely to unsettle once again the perception of the context, so that new inventories become necessary.

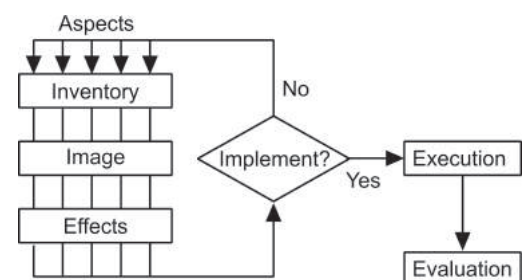
49.2 THE CYCLE OF FORMING PLANS

Every consideration regarding the design process can be distinguished by at least three phases: the formation of the image, that which precedes it, and that which comes afterwards. What proceeds it can be called ‘taking inventory’ and what follows can be called ‘decision-making’ (analysis of effects, and a decision to execute).

Eekhout calls this entire cyclical process ‘development’^b. He makes diagrams of cycles that repeatedly contain this three-phase process. Brouwer does this in an even more complicated way^c, but also returns to the same three aspects. Here we are using a more abstract

49.1	Taking an inventory of ‘context’	443
49.2	The cycle of forming plans	443
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49.4	The interface between taking inventory and image formation	444
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49.6	Composition analysis	445
49.7	Analysis of effects ex ante	446
49.8	Various language games during the meeting	446
49.9	The empirical reduction to place and/or time	447
49.10	Reductions that go too far for the design	448
49.11	Images of a reality that never existed	448
49.12	Obstructive pre-suppositions	449

		OBJECT	
		Determined	Variable
CONTEXT	Determined	Design research	Design study
	Variable	Typological research	Study by design



481 Cycle of forming plans

a The conception is also referred to as a ‘concept’, but this leads to scientific confusion with the psychological term “concept”.
 b Eekhout, A.C.J.M. (1997) *POPO of ontwerpen voor bouwproducten en bouwcomponenten*.
 c Brouwer, J. (1998) *Contribution RSDC-congress*.

outline of a single cycle, noting that this cycle can be “nested” (a computer term that indicates that a procedure can be recorded “in itself”).

As soon as one has made the decision to execute, once again various designs must be made: one also needs to have an image of the design’s technical, economic, and social execution. They vary based on the context. In organisation theory, we also have ‘the design of the organisation’.^a These three executive design processes all include the same three phases of taking inventory, forming the image and making decisions. The decision-making process consists of conveying the effects of the designed image (analysis of effects), followed by the actual decision.

If the decision to execute is negative, one can throw the entire project overboard, or begin anew by again taking inventory (possibly in a minimal fashion) and using these results to arrive at a new formation of the image, and a new decision process. This process and its variants have been extensively described as ‘design methods’ in the literature. In this Chapter, we will limit ourselves to short critical comments and a certain perspective on methods and techniques of image formation.

49.3 TAKING INVENTORY BEFORE THE DESIGN

The formation of the image and decision-making process is orientated towards, respectively, the possible and the (collectively) desirable. Taking inventory, however, is a reduction from the *existing* context and the probable developments within it. It is therefore orientated towards *probable* futures (see the diagram on page 21) in the perspective of what is possible. It can involve an inventory of wants (those of society, of the customer, of the party executing the commission), but here the taking of inventory itself does not form part of the mode of what is desired. The inventory involves objectivity with regard to the “probable” desires of others.

Even an inventory of current possibilities, like the dimensions of the site, or current drainage and outcropping situation, do not need to form part of the mode of what is possible. Thus a morphological analysis of the topography, or typological research into previously presented solutions, is per definition empirical, stemming from experience with what exists, and what is therefore probable.

This first ‘objective’ taking of inventory, however, would be pointless to carry out for the design if all data were simply copied, a mistake that every beginning designer makes: he traces ever more data from the site onto their transparencies. This kind of excess can obstruct the view of possibilities. There needs to be a reduction in perspective of what is possible and desirable. Thus one deliberately excludes some elements in the inventory (though this must be mentioned during the presentation), but one can also include elements no one has noticed yet.

A postulated concept or type helps in this taking of inventory, but can also get in the way during later consideration of other concepts. This form of ‘reading’ the site with its buildings can, in its drawn representation, already bear the traces of selective attention, which then shapes the delimitation of components in the site and its buildings in a way other than expected (focus). This form of selective attention is based on personal experience with other objects, sites, forms, and concepts, without pre-supposed categories and legend units (erudition), or on experience with one’s own designs and the design resources represented therein (repertoire).

49.4 THE INTERFACE BETWEEN TAKING INVENTORY AND IMAGE FORMATION

As soon as one starts drawing lines where they do not exist (interpretation), one crosses the border between taking inventory and image formation. Yet these lines do not necessarily need to be part of an image already present in the mind’s eye of the designer. In the process of interpretation, it is wise to delay any such image as long as possible in order to give a chance to all possibilities. The formation of the image is such an individual matter that every gener-

a Ramondt, J.J. (1996) *Organisatiediagnostiek, een methode voor vraaggericht onderzoek*.

alisation one tries to draw in that area can impede formation of the image. A special Chapter has been dedicated to the general philosophical and psychological aspects of image formation (see page 413).

We are restricting ourselves here to two analytical methods, both a possible start of a design: transformation of the existing situation by re-design and composition analysis.

49.5 TRANSFORMATIONS

If one changes the legend category of ‘concrete’ into ‘steel’ in an architectural drawing, a completely different design is created (legend transformation). Often, the shape of the indicated elements in the drawing has to be changed because a different construction is necessary. There will be other important technical effects, like construction-physical effects, effects on the building process, effects on the intersections, mechanics and function of constructional elements. Yet there are also visual, therefore cultural effects, economic, therefore administrative effects.

Aside from transformations in the legend, one can also propose transformations of form and transformations of structure, which lead to new forms, and structures in a certain initial position. Thus the Amsterdam district ‘De Baarsjes’ was re-constructed as a result of an image improvement campaign as if it had to be re-designed from scratch, with a minimum of design interventions (morphological reconstruction). Towards this end, a pattern of standard housing blocks was drawn over the area (division). Thus the current composition was approached with a measurement tolerance of 30%.

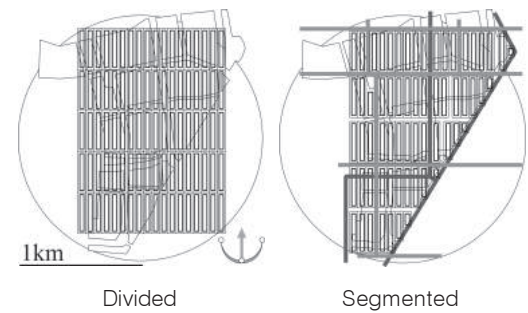
As a result of this initial adaptation of the area, a second was applied: ‘segmented’. This meant that some streets were expanded, at the cost of the housing blocks, for the benefit of connecting roads that open up the neighbourhood to the outside. With this adaptation, the current area was approached with a tolerance of 20%. A third adaptation, ‘tailoring’^a, brought with it both narrowing as well as expanding within the composition, whereby it was fit into the existing borders so that a tolerance of 10% was achieved. The last adaptation, the ‘detailing’ was only schematically represented. This required arrangement of components in the composition so that elements like details could be named as a result.^b

These kinds of transformations can be described as objects of study by design. In landscape architecture they are applied for the theoretical transition from a natural landscape to a cultural landscape, and from a cultural landscape to an urban landscape.^c

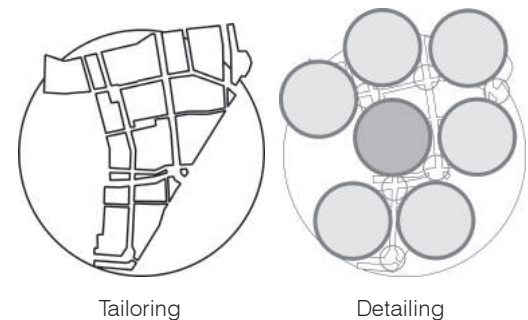
49.6 COMPOSITION ANALYSIS

The constellation in a diagram or prototype does not yet have proportion. Yet in a composition, the proportion of the components and details does play an important rôle.^d A composition is thus scale-dependent, a constellation much less so. A detail in a composition can be a component in another composition on another scale, with another grain. That is why it is important to keep sight of scale of components and details in the composition. As a rule of thumb, one can maintain that the “radius” of a component is about 1/3 of the composition as a whole. The surface of a component is then about 1/10, the content 1/30. Yet the details can also play an important rôle in the composition. As a rule of thumb, one can maintain that elements with a radius smaller than 1/10 of the composition as a whole are called ‘details’.

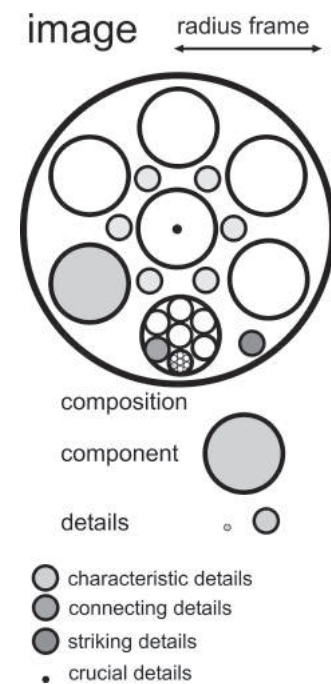
There are many kinds of details. Characteristic details identify a component. If one draws such a detail, the reader knows that more of these details appear in the components. They can play a rôle in explaining the legend that accompanies the component. Connection details lie in-between components. The term is mainly used in the field of construction, but connection details play an important rôle in urban development as well. A district, for example, can consist of seven components (neighbourhoods). If two neighbourhoods are separated by a



482 Division and segmentation



483 Tailoring and detailing



484 Composition, components and details

- a This ‘tailoring’ adaptation and what follows are completely analogous to what tailors (couturiers) mean by this: making something fit the body and on the basis of this, applying the details such as seams and buttons.
- b This method was inspired by the publication by Hoeven, C. van der and J. Louwe (1985) *Amsterdam als stedelijk bouwwerk: een morfologische analyse*.
- c Reh, W., C. Steenbergen et al. (1995) *Landschapstransformaties*.
- d This composition does not address the separations and connections (structure) that technically keep it together. In that case, we have a system.



485 Vista from the Louvre to La Défense⁸⁴

road that opens to the larger district, then, at district level, this road forms a connection detail between the neighbourhoods.

This observation can be reason to give this road an asymmetrical profile, or a reason to provide the neighbourhood with varied façades that would give a characteristic impression of the areas that one is 'in-between'. In this case, a road that leads out into the larger district might then have to display a more symmetric profile. If the road comes to a square between three neighbourhoods, this square is then an important connection detail.

Striking details do not need to be characteristic, or have a connecting function, to be still a hallmark in the entire composition. Thus one can speak of the 'area by the windmill' if an old windmill provides a prominent point of recognition. Striking details can hallmark important positions in the composition.

Crucial details are details whose influence on the composition is as significant as a component's. The importance of such details extends well beyond their size. Thus the Arc de Triomphe on the Place Charles de Gaulle in Paris is a crucial detail in the line of sight from the Louvre to La Défense.

49.7 ANALYSIS OF EFFECTS EX ANTE

Analysis of effects is pre-supposed in every decision process, but is never completely executed. The methodological problems of effects analysis preceding the execution (evaluation ex ante, see page 159) are enormous. Each new perspective on the probable future leads to different effects on the same design. This is why people like to leave effects analysis to individual participants in the decision-making meeting. After all, before they arrive at the meeting, these participants have already studied the design from their own perspective of the future, as well as the effects they consider important, and have possibly already discussed in reports.

Yet, it is their significance in the meeting that determines how heavily the various effects will be weighed in relation to each other. Furthermore, in absence of their suffering objects (for example the future user) or scientific operationability, many effects simply remain outside consideration during the decision-making meeting. This is a major responsibility for the designer, who of course has already considered these effects with every pen stroke of his or her design. Does this design intervention have the intended effects on the programme of requirements and the individual ambitions of the designer of the job? To which unintended effects (desired, probable or possible) does this transformation lead?^b

These considerations during the design process must be at hand during presentation in a decision-making meeting. All the more reason to document the design process verbally as well. Computer programs for assisting designers can help in this regard, but to a degree.^c The choice of words, metaphors, and arguments that make an impression in a specific context boils down to a question of verbal talent and experience.

Unfortunately, evaluation after the execution (evaluation ex post, see page 151) usually remains unpublished, due to budgetary considerations. Not every party that commissions objects with structures as long-term as those in construction necessarily benefits from such an evaluation. A potentially bad evaluation can have major consequences upon the object's value, and bad publicity can be ruinous.

49.8 VARIOUS LANGUAGE GAMES DURING THE MEETING

Decision-making demands a reduction into discussable topics that can be tested against what is collectively considered desirable. The chairman of a meeting, and its administrative participants in the decision-making process, reduce reality to points on the agenda. And not everything gets a place on the agenda. The first concern of every participant in the decision-making process is ensuring that the points important to him or her be included on it.

a Source: Guides Gallimard (1994) *Le Louvre*.
 b Jong, T.M. de (1995) *Systematische transformaties in het getekende ontwerp en hun effect*.
 c Boelen, A. (in preparation) *Clarifying presuppositions in design*.

During the meeting, an extensive reduction takes place, in which at least location and time are recorded in the form of appointments and agreements. The minutes testify to this process of reduction. They do not need to be a completely accurate historical representation of the meeting, with all agenda points and the discussions and considerations that these points invoke, as long as everyone can approve of this account. It may have even been reduced to the form of agreements, during the next meeting. And here the term ‘agreements’ refers to where and when things are to take place. Thus in the mode of what is desirable, there is a case of two reductions of the polymorph and confusing reality: a reduction to sort, and a reduction to place and time.

One can also discern these two kinds of reduction in other language-games^a regarding what one knows what one is capable of, and in the modes^b of the probable and possible. These, however, wind up looking different, and this leads to confusion of terms between the sectors, and to significant methodological differences.

The empirical researcher plays an important rôle in the inventory process. He or she reduces his or her reality not into points on the agenda, but rather into variables. These are nameable characteristics, be they verbal, denumerable, numerable, or measurable^c, which can take on different or changing values without negating the designation of the given characteristic. This is a reduction to sort: a dissection (analysis) of perceptions about actual objects reduced to ‘characteristics’ that can be represented and put into operation for studying. This reduction of perceptions allows for differences or changes (specifically between ‘values’) in only one direction (‘dimension’) per variable.

The rest of the perception is excluded^d as a result of the processes of naming and delineation (definition), and is often presumed to be the same (*ceteris paribus*). This unspoken, undifferentiated quality of ‘the rest’ is only penetrated when a characteristic can be designated a variable in the excluded area. As long as this remains impossible, Wittgenstein’s rule applies: “*Wovon mann nicht sprechen kann, darüber muss mann schweigen*”.^e Any sense of doubt regarding the acceptability of this kind of reduction can be witnessed, according to the later Wittgenstein^f, in the post-modern discussion on the contextuality of ‘general’ statements (which, if only for that reason, are no longer ‘general’) and the differential thinking it has resulted in.^g

49.9 THE EMPIRICAL REDUCTION TO PLACE AND/OR TIME

The reduction to place and/or time is then the (mathematically documented) simulation of the relationship between variables in order to find a similarity with reality. The researcher will not rest with the fact that every variable can take on any arbitrary value: instead he looks for relationships among these variables in order to further limit their ability to move, with the goal of being able to make predictions.

If, after all, possible future characteristics of objects (variables) are supposed to be able to take on values independent from each other (as is sometimes required or caused by design), then there are no longer any expectations one can rely on.

Relationships between variables pre-suppose a far-reaching reduction to place and/or time, not always acceptable for designers. Indeed, relating two variables demands a sequential (denumerable) and corresponding arrangement of values in both variables.

If in the set of perceived values Y from the variable y, for example, any value is twice as big as that of the same position in x (the first position is 1, the second position is 2, the third position is 3, etc.) in every counted position in this variable (the first position is 2, the second position is 4, the third position is 6, etc.), then this is documented in a mathematical ‘equation’ ($y=2x$). This relation would become inconceivable if one were to compare the 1 in X with the 6 in Y, and then the 2 and X with the 2 in Y. Sequentiality tacitly pre-supposes a fixed sequence in one space or another (differences) or in time (changes). Without such an *inter-*

	Choosing	Knowledge	Ability
Modes:	Desirable	Probable	Possible
Sectors:	Management	Scientific	Technical
Education:	LLM.	Doctor	Engineer
Activities:	Policy	Empirical Research	Design
Reductions Towards:			
Type:	Agenda	Variables	Legend
Place And / Or Time:	Arrangements	Relationships	Tolerances

486 Language games

- a This is a term of Wittgenstein, L. (1953) *Philosophische Untersuchungen*. Recent edition: Wittgenstein, L. and G.E.M. Anscombe (1997) *Philosophical investigations*.
- b This is a Kantian term that has taken on a new interpretation in modal logic.
- c Stevens, S.S. (1946) *On the theory of scales of measurement*.
- d Spinoza: ‘Every determination contains a negation.’
- e Wittgenstein, L. (1922) *Tractatus logico-philosophicus*. Recent edition: Wittgenstein, L., Pears D.F. et al. (2001) *Tractatus logico-philosophicus*.
- f Wittgenstein, L. (1953) *Philosophische Untersuchungen*.
- g Jsseling, S (1986) *Jaques Derrida, een inleiding in zijn denken*.

nally denumerable spatial or temporal order, every relationship *between* variables would become impossible.

There is, however, in this seemingly self-evident form of reasoning, something else pre-supposed between the lines, something designers are not always able to deal with: a likeness in distance or duration *between* the values within one variable (intervals). The values are not only made denumerable (numerically varying only in their position) but also countable (computationally the same in the spacing of their sub-divisions).

Counting pre-supposes *equality* in the elements being counted. Thus this is fundamentally insufficient, if only on the basis of the elements' different positions in reality.

If, for example, a programme of requirements is compiled this way, the designer can find opportunities in the formation of the image to combine or analyse numbered and computed functions into new functions (categories) that were not provided for in the variables (and their implicit and largely traditional delimitation) initially chosen. These must first be designated again in new variables in order to relate them then to the customer's list of desires, which list has since been changed by the design. This demands the necessary conceptual abilities from all participants.

One can *logically* conclude that "if $x=1$, then $y=2$ ". Yet this does not establish any *causal* relationship: "doubling x *causes* a doubling of y " (think of the temporal proportion between the number of storks and births that was once demonstrated in Sweden)^a In empiricism, the step from logical to causal conclusion is often made too easily, and on closer inspection it has something mystical to it.

49.10 REDUCTIONS THAT GO TOO FAR FOR THE DESIGN

These methods of reducing and representing reality have turned out to be unusually fruitful in almost every scientific field, except that of formulating the image in design. The epistemological limits of these 'scientific methods' are greater than many realise, and are often too big for 'integral' (and differentiating) designers. Designers are not called in to recreate what already exists, but rather to create new possibilities that do not yet exist in a given context. Furthermore, this method is subject to the law of diminishing marginal returns, now that most of the globally generalisable relationships between nameable and named variables have been elucidated. What now remains are more and more context-dependent local problems.

And with this, more (and more varied) causes, or should we more cautiously call 'conditions', are leading to new possibilities within this context. The desired possibilities here form part of a much bigger collection of possibilities which may be useful at some point in the lifespan of an architectural object, yet which cannot be provided for in the programme of present desires. These same causes then lead, even as a result of minute variations in material and social conditions, to various results (chaos theory), or the same consequence is elicited by various causes (many roads lead to Rome). These problems with the empirical method have been studied not only in architectural design, but in organisation theory and ecology as well.^b

49.11 IMAGES OF A REALITY THAT NEVER EXISTED

From an empirical, truth-seeking point of view, the designer is a liar, making, after all, images of a reality that does not exist. What matters, though, is that it *can* exist in the mode of the possible, without being an extrapolation of perceived relationships (prediction). The empiricist is also involved with possible futures (probable futures, which are per definition possible futures) in the form of predictions, but the designer is only called in when these are undesired, when a customer wants *something different* than the most probable, or something different than the average one gets from the calculus of probability (for example, something different than the standard-setting VINEX districts).^a

a Draak, J. den (1993) *Van blauwdruk naar draaiboek, scenario's in de ruimtelijke planning en volkshuisvesting*.

b Riemsdijk, M.J. van (1999) *Dilemma's in de bedrijfskundige wetenschap*.

From an empirical perspective, the designer can also be considered a charlatan, since in this outline phase of the design, he cannot fall back on any verbally or numerically arranged list of characteristics regarding the object proposed, because it is multi-functional and pre-eminently context-sensitive. A lit match in a petrol station has a completely different effect than in a living room. This can be mono-causally established by putting one of the context's variables into operation, but a multi-causal bit of havoc that simply feels better here than there cannot usually be verbally expressed in the form of points. That's why *various* living environments should be made available, so as to leave the choice up to the user.

These various environments have to be designed. In architecture, there are few one-to-one, cause-and-result relationships not generally known, but that have rather been declared as solved, and subsequently recorded in the body of design experience without much challenge from the science of design. This does not alter the fact, by the way, that many design mistakes are still made in that field, and should be empirically refuted via *ex ante* and *ex post* evaluation. Yet image formation itself does not fulfill the standard requirements of empirical-scientific reduction of the present reality. There is another very valid reason: many design decisions for multi-functional facilities like a flat or a district cannot verbally or numerically be put into operation in this manner, are not clearly verifiable against a specific goal, even though they are accounted for in retrospect. These are choices from an infinite number of alternatives with one result that is, considered from many viewpoints at once, presumably equal.

49.12 OBSTRUCTIVE PRE-SUPPOSITIONS

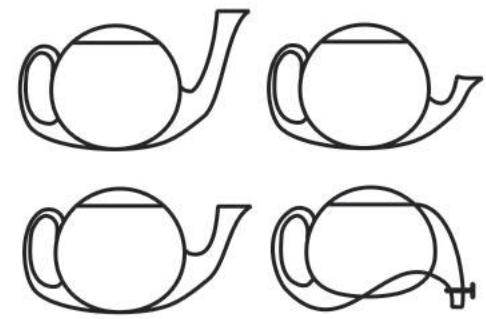
There are solutions that can empirically be rejected, though they lead to an unexpectedly favourable result under particular additional circumstances (context). In these cases, empiricism notoriously interferes with creativity. From a debate with Klaasen (see page 183), I have borrowed the example of the design for a teapot.^b In that design, knowledge of the empirical law of the two communicating vessels is indispensable. After all, if you make the spout higher than the mouth, the tea pours out of the mouth, and not out of the spout. If you make it lower, then the tea spills out of the spout if you fill the pot with too much water.

The property 'height' from the mouth H_v must therefore be the same as the property 'height' from the spout H_s , in the formula $H_v = H_s$. This empirical schedule of demands, however, impedes a creative solution: having a spout near the bottom that points downwards, with a small valve in it. The pre-condition for this is once again that the teapot be placed a bit higher than the base. And, incidentally, if we place a small plate under the spout, we have also reduced the problem of the spout dripping on the tablecloth.

The question is now whether the name 'spout' still suffices, and whether, in retrospect, the scientific reduction to a variable 'spout height' in the inventory phase might have set us off on the wrong foot. The general concept of 'spout' was tacitly presumed in the inventory process.

These unspoken pre-suppositions form a major problem in the use of seemingly reliable computer programs, for example. They inadvertently steer your thoughts. Powerpoint is a good example.

Boelen^c defines creativity as the wilful excluding of at least one generally accepted and thus collectively concealed pre-supposition. He designed a computer programme that initially lets the designer draw freely without a legend, and that makes predictions on the basis of shape and size, which the designer can then accept or reject in the process of drawing up the legend. Hereby, designers also become conscious of their own or others' tacit pre-suppositions. The general and indiscriminately accepted pre-suppositions in environmental policy, and the environmental research dependent upon it, also warrant a thorough study into unspoken pre-suppositions.



487 Teapot

- a VROM (1992) *Vierde nota over de ruimtelijke ordening Extra*.
- b Klaasen, I.T. (1998) *Stedelijk regionaal ontwerpen*.
- c Boelen, A. (in preparation) *Clarifying presuppositions in design*.

