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.

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

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?"

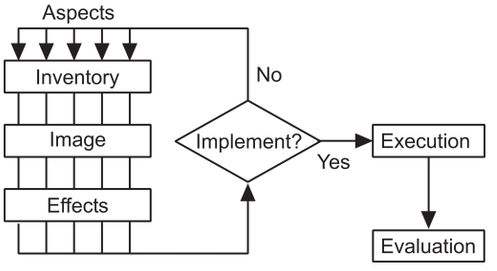
49.1 TAKING AN INVENTORY OF 'CONTEXT'

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



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*.

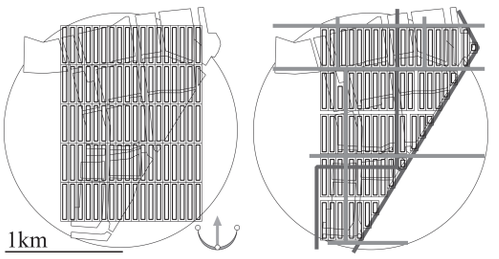
alisation one tries to draw in that area can impede formation of the image. A special Chapter has been dedicated to the general philosophical and psychological aspects of image formation (see page 413).

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.

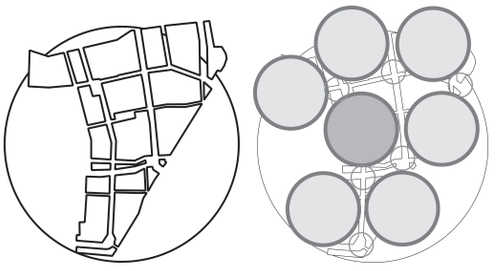
49.5 TRANSFORMATIONS

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%.



482 Division and segmentation



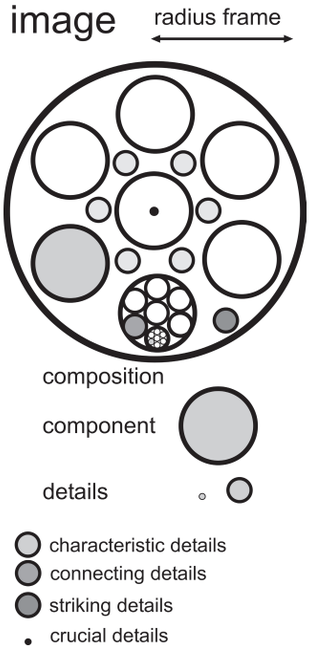
483 Tailoring and detailing

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 abut 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'.



484 Composition, components and details

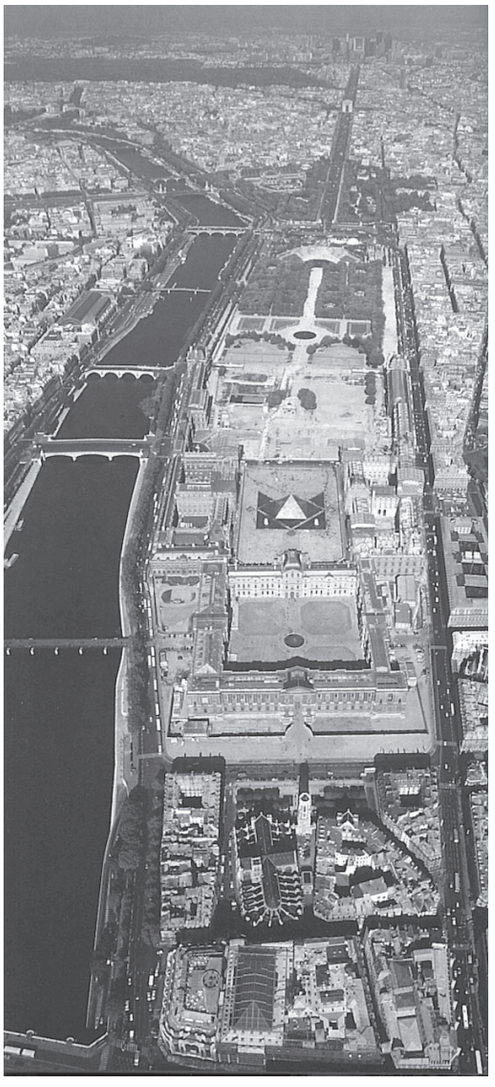
There are many kinds of details. Characteristic details identify a component. If one draws such a detail, the reader knows that more of these details appear in the components. They can play a rôle in explaning the legend that accompanies the component. Connection details lie in-between components. The 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

a This 'tailoring' adaptation and what follows are completely analogous to what tailors (couturiers) mean by this: making something fir 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 Défense[84]

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.

	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

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 eachother (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 acceptible 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-*

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 IJsseling, 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.

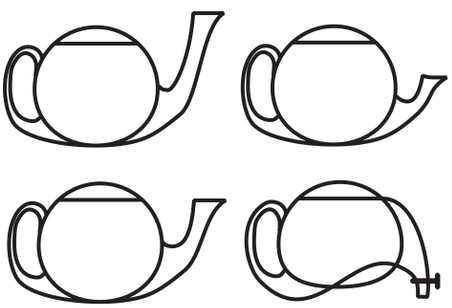
These various environments have to be designed. In architecture, there are few one-to-one, cause-and-result relationships not generally known, but that have rather been declared as solved, and subsequently recorded in the body of design experience without much challenge from the science of design. This 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_t, in the formula $H_v=H_t$. 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.



487 Teapot

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.

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.*