ACSA

Conference book
Design Studies
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<tr>
<th>Category</th>
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<tr>
<td>Published and</td>
<td>Publikatieburo Bouwkunde</td>
</tr>
<tr>
<td>Distributed by</td>
<td>Faculteit der Bouwkunde / Technische Universiteit Delft</td>
</tr>
<tr>
<td></td>
<td>Berlageweg 1 2628 CR Delft / Telephone (31)15 784737</td>
</tr>
<tr>
<td>Commissioned by</td>
<td>Delft University of Technology, Faculty of Architecture, Housing, Urban Design and Planning</td>
</tr>
<tr>
<td>Compiled by</td>
<td>Umberto Barbieri, Leen van Duin, Henk Engel, Endry van Velzen, Willemijn Wilms Floet.</td>
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<td></td>
<td>James Burge, Camerino</td>
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<tr>
<td>Book design</td>
<td>Henk Berkman / Publikatieburo Bouwkunde</td>
</tr>
<tr>
<td>Lay-out</td>
<td>Liesbeth Boeter</td>
</tr>
<tr>
<td>Cover</td>
<td>Jack Breen</td>
</tr>
<tr>
<td>Printed</td>
<td>NKB Offset bv / Bleiswijk</td>
</tr>
<tr>
<td>Copyright © 1992</td>
<td>by the authors.</td>
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</tbody>
</table>

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ACSA EUROPEAN SCHOOLS OF ARCHITECTURE CONFERENCE 1992

Conference book

Design studies

Delft University of Technology / Faculty of Architecture, Housing, Urban Design and Planning / The Netherlands

Publikatieburo Bouwkunde / 1992
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Jan Brouwer

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diametrically opposed to each other: Grassi is associated with Southern European countries, form, continuity, tradition, Price with Anglo-Saxon countries, programme, change, experiment. Despite the different results there are striking similarities between the contexts within which their design studies are created and function. For example, the design is always accompanied by a text and/or other documents which give an account of the problem focussed on by the study and the way of working on this. This account goes beyond the usual plan commentary, because with the design a theoretical context is also offered within which the study can be understood. The theoretical discourse is further developed in texts whose origins are separate from specific design studies, often in the academic world: lectures, theoretical studies, translations, exhibitions and so on. Research and teaching, theory and design, university and practice are indissolubly bound to each other in the oeuvres of the two architects.

A similar interaction is also characteristic of the work of Alberto Ferlenga. In the practice of this young Italian architect the conditions of a fertile architectural culture are brought together in a striking way, because apart from his activities as architect and professor he is also responsible, as editor, for the architectural publications of the Electa publishing house.

We therefore consider the work of Giorgio Grassi, Cedric Price and Alberto Ferlenga to be of great importance in stimulating the discussion of designing research.

Apart from documentation of the work of these architects, in this book an account is given of the Dutch situation and the role which the Delft Faculty plays, or could play, in this. That is done by means of a number of short contributions.

Carel Weeber examines the great number of urban planning design studies which are carried out for municipalities and the state and raises the question of the effect of these studies. Erik Pasveer describes the changing status of the urban design and its significance for design studies. Teake M. de Jong deals with the methodological question of design studies. Jan Molema gives a survey of various forms of technical research and the place of design studies in this. Using a specific example, Mick Eekhout shows how design studies can play a role in the development of a new product. Jan Brouwer indicates the position which design studies could occupy in technical research at the Delft faculty.
Giorgio Grassi, Town-hall, Gavà 1989
An opinion on architectural education and the conditions our profession has to work in
GIORGIO GRASSI

First of all, I would like to say that school is just a phase, one stage in learning to be an architect (I believe that everybody agrees with me on this). In my opinion, learning is a very long process, much longer and much broader than the period spent at school. (The truth is that I am thinking of a very long-term process: I think that our profession is suitable for people who live a long time). Perhaps learning ceases when one reaches a kind of maturity. It is a process that tends toward equilibrium, to a sort of stability (this does not necessarily mean pacification). But this is not something personal; on the contrary, it is completely related to the world outside. It is something which concerns one's relationship with the rest of the world (with that portion that relates to our profession).

Roughly, one could say that our profession comprises a technical side (which can be more or less elementary) and a definite attitude towards design, a definite inclination to a way of practicing architecture. Obviously, learning consists in technical learning and in developing an attitude towards designing. Naturally, it would take a long time to discuss technical teaching (which constitutes much of learning and which never is merely technical).

But today I want to talk about the second aspect: the attitude towards designing. I believe that this is by far the most important thing for architectural students today (because there really are too many influences on them: books, reviews, etc.). In other words, by far the most important thing for architectural students today is forming a reasoned, coherent opinion on architecture as a whole (this is much more important than a beautiful project). What I mean is acquiring a reasoned idea about architecture as a profession which can act as the foundation for one's practice (as the base for design and, at the same time, as a critical element in the design process).
In this sense, a fundamental aspect of education is forming an opinion on architectural history (i.e., our stand on historical experience). Of course, I am referring to the development of theory of design, but, above all, I have in mind the direct experience of history, the direct physical experience of (more or less) ancient architecture that we can and must undergo. I am talking about the buildings we go to visit, to study (as tourists, but not just tourists). I consider this direct contact with architecture essential. Perhaps it is the only true teaching which students can still get, the only teaching today which is unambiguous. For example, when we are working on a project, we can talk and talk about its relationship to history, of its place in architectural history, etc. But we need examples in order to understand one another. What I mean is: a visit to Tempio Malatestiano, or to the facade of Santa Maria Novella, is much more useful in this case that lots of theoretical discussions (and it is much clearer, too).

An essential moment in learning is when the student finally sees the architecture of the past - his profession's tradition - as something more than a leftover from the distant past and he realizes that it is a real help. At this point, the student understands that it can nourish his own work, like material for his own work. Igor Stravinsky once said: 'Everything which is not tradition is plagiarizing!'. This means that you cannot build anything unless you start from something else. In other words, the designer's imagination (an essential part of our tools) always works on known things. By the way, I would like to note briefly the difference between having images and having imagination (between the ability to evoke images and the capacity to do something with an image: i.e., the image and its virtuality). I will not go into this distinction because I am only interested in the second possibility. And there is no point reminding you that tradition does not mean repeating what already has been done. On the contrary, tradition means the importance of things that last (Adolf Loos, for one, was very much aware of this when he defended the Viennese tradition against folklore and formal experimentalism).

I believe that an essential stage in learning is when the student succeeds in viewing the buildings he visits, not as a cultured tourist or an intellectual, but as a technician who observes and judges. The architecture he or she looks at may be old or new, but it is generally better if the buildings are antique. When the student looks to learn, when the so-called historical perspective no longer is an essential factor in knowing: this is the turning point. Then the student looks in order to
FOREWORD

In recent years, the Faculty of Architecture, Housing, Urban Design and Planning has been undergoing large changes in the training and research programmes. These changes follow on from the signals received from professional practice, but above all from the desire of staff and students to design programmes and organization in such a way that they play along with new developments in the field of architecture in an international context. As in 1992 the University of Technology at Delft is celebrating its 150 years in existence, and ACSA was planning to organise a congress in collaboration with a European university, it was decided to organise this congress as a collaboration between ACSA and the Faculty in Delft. After careful consideration it was also decided to place the emphasis in this congress on research in relation to architectural education.

We are aware that the time is long gone when the designing of buildings, cities and landscapes could develop without proper reflection from designing research. Ends and means must be well attuned to each other, as well as the various aspects of function, structure and form, and of pattern and process.

The professional field is renewing itself through the development of new materials and construction techniques, new aids such as the computer, and new problems such as the growth of cities and mobility, environmental protection and energy saving, and the confrontation of rich and poor. It leads to new tasks for the architect and the accompanying research must be newly formulated. Partly as a consequence of these problems, the congress is set up along 3 main lines:

- designing research in the field of Architecture and Urban Planning;
- designing research in the field of Building Technology;
- architectural research in connection with computer-backed designing.

For the Faculty of Architecture, Housing, Urban Design and Planning these themes are elements of a new research programme which was started up last year. They form a foundation for the main subject of Architecture, Housing, Urban Design and Building Technology. Our faculty therefore regards this congress as a welcome opportunity to achieve a better foundation and execution of design research. And in this way also, a more intensive cooperation with European and American Architecture faculties.

I hope that it will be a fruitful congress.

Frans Maas
Dean of the Faculty of Architecture, Housing, Urban Design and Planning, TU Delft.
Introduction

ENDR Y VAN VELZEN

The congress 'Research as it relates to architectural teaching' concentrates on a specific form of architectural research, that is, designing research. Design studies can be distinguished from other forms of architectural research, such as evaluative research, feasibility studies or fundamental technical research, in that they generate possible, new solutions for a problem. This concentration is dictated by two considerations.

In the first place, in our opinion, design studies play an important role in the continuous redefining of the professional field of the architect and thus indirectly in the continuous adjustment of curricula of training institutions. After all, determining the desired knowledge and skills of the future architect and the choice of a particular didactic method takes place on the basis of a specific idea of the professional field. The continuous adjustment of curricula is not only the consequence of external influences, but is also partly an aspect of the design training itself. In this it is possible to explore and shift the boundaries of the professional field.

In the second place, in recent years design studies have been increasingly used as research instruments for new tasks, such as the approach to urban restructuring areas and the periphery for example, or the development of new building products. Although there is generally large public interest in these studies, its institutional embedding is usually very limited. In professional discussions, the attention is often too much focused on 'artistic' aspects, while in academic circles, there are references to the dubious 'scientific' aspects. Often, the political and social significance of design studies is also unclear and unpredictable.

In general we can state that the various bodies involved in architecture and town
planning (politicians, clients, architects, industry, magazines, architectural museums etc.) function more independently of each other than, let us say, thirty years ago. This is not the place to go extensively into the backgrounds to this social and professional disintegration, nor to reflect nostalgically upon it. The question is rather the relations between the various institutions now, and more specifically, what position universities (and architectural colleges) can or should occupy in this. Universities have always been institutions where a professional field is studied and taught. From this point of view, design studies - as trait d'union between design, research and teaching, but also as possible link between research demand from society and research supply by the university - are of great importance.

Nevertheless, design studies are by no means always an obvious part of the academic business. That is encouraged by emphasising the autobiographical - hence subjective - character of design studies, with the consequence that such research can lay hardly any claim to budgets for scientific research. In our opinion, in order to give design studies a clear position in the university, it is necessary to consider the following questions:

1. The question of the nature, the range and the importance of design studies as research instrument.
2. The question of the theoretical and methodological context of design studies and the way this diversity should be dealt with.
3. The question of the social and professional significance of the results of design studies and the way this significance is determined by awarding briefs, discussions, publications, manifestations, etc.

These questions about design studies formulate the problem for this congress and form the context of this book. The book contains texts on design and theory, and presentations of design studies.

Design studies make up an important part of the oeuvres of Giorgio Grassi and Cedric Price. These architects share a common repugnance for formalism and through their studies thematise the relation between social and architectural questions, but come to radically different conclusions in this. For years, with their work they have formed important markers in thinking about architecture. Their spheres of influence can be roughly fixed in geographical terms, and their ideas are
master the constructions' *technical reasons*, their technical secrets, which have become more important than the *historical reasons*. Then he or she observes in order to learn how it was done, judging the work as if it were his or hers, looking at it from the point of view of his or her own work. Paul Valéry made this limpid statement about his relationship with the works displayed in museums: 'A work of art provides me with ideas, teachings, not pleasure. Since my pleasure is doing, not having things done to me'. This is the way we have to go visit the works of the past. We should be driven by need, so we will go to see the works that seem necessary to us at the time.

I teach *architectural composition* in a very big school where there are lots and lots of students, but my working group is rather small. Since it has relatively few students, you might think it is an élite group, but this is not so. The opposite is true. We have relatively few students because we do not have any satisfactory answers to their questions which are almost always urgent and unreasonable (besides, almost all of them seek the quickest results possible). The students caught on to this some time ago and they pass the word around. Actually, we even have some questions to pose and are uncertain about many things. We think that our task is, first of all, to share this with the students (to transmit *doubt* to them, above all: doubt is the only thing we are sure about and can use as a point of departure).

We do not teach the students how to create a *beautiful* project, a brilliant, gratifying design that will earn them praise. The truth is we would not be able to. We just teach the students what one has to do, in our opinion, to create an *honest* project. ('The purpose of an honest work', and I am quoting Valéry again, 'is clear and simple: to make people think'). Honest: i.e., coherent with the conditions of architecture today and with the profession's tradition. We do not want designing to become less than a *job*. It must at least retain the dignity of a job like any other. Because this is very often what happens today in architecture: a job is transformed into *gratuitous toil*. We do not give the students practical advice which they can put to immediate use. Rather, we attempt to teach them to work with clarity (we actually discourage artists; and we still think that a good project can always be described without difficulty). We oblige the students to look clearly at the conditions influencing their work (to look pitilessly at all the difficulties and limitations). This seems very important to me today; especially since today students are literally swamped by images, by forms without reasons, etc. And the
first thing that this clear observation reveals is the difference between past and present, between tradition and architecture's current conditions, and between the relative sureness of conditions in the past and the total uncertainty of the present ones. (The difference is also between a past based partly on convention, but which could also count on shared means and goals, and a present based on individualism in design work, on formal experimentalism, etc.).

My impression is that everything I have said so far is a platitude. Now I am going to make another banal statement: the chief thing a student must learn to demand from him or herself is awareness of what he or she is doing (the sooner one achieves it, the better, because it enables one to save a lot of effort, time and delusions, too). Formal exercises do not do anybody any good, particularly those who have to do them. A clumsy, halting project with a reasoned character is better than a beautiful one without any meaning behind it (maybe everybody says this, but it is hard to put into practice). And since it is fundamental for what one does in architecture to be coherent with one thinks of it, it is important to start from the latter aspect: forming an opinion, above all (you may make a mistake, this happens to everybody, but you will improve as time goes by).

Achieving this awareness is not such an easy thing (especially since today our profession seems to have become totally useless, and it no longer meets any real, collective needs). But students have to know why they do things, because this is the only way that allows them to understand the thing one always learns last and the hard way: our profession does not allow any arbitrary action. The first consequence of this awareness is, in fact, the control that one exerts on ones choices: this is precisely coherence in one's work. This awareness really is our only goal at school (in any case, it is also my main objective as an architect).

In this way, the school becomes the formation of a common view-point. And the work, the design investigation and experimentation is shared. However, not even this kind of teamwork enables us to share the formal choices of the individual project created by the group at school (that's how far things have gone in architecture - one of the most highly collective activities!). When I see a teacher correct, pencil in hand, a student's project, I have to admit I envy this person. I would not be able to do it. I would not know where to start (I do not think I have ever used a pencil during the discussion of a project at school). I am also a bit
ashamed of our job as teachers, which allows us to pretend so easily. The truth is that today teacher and pupil are on the same level when it comes to designing: full of doubts and uncertainties (and they have the now familiar sensation that they are doing something useless and senseless). The only difference is that one has a little more experience than the other and is a little more aware of what he or she is doing, of the difficulties and uncertainties one has to face each time. Today there is nothing general to teach. Everybody does what he or she thinks best. So even an atelier's significance is very restricted, because it is an isolated experience. Today nobody can call him or herself a master, if you reflect on this a little: nobody has anything practical to teach, something which is equal to the task and the expectations, something which is valid according to a common base (we are well aware that this is an essential condition for architecture). Today there are no certainties in our profession to share. Today the only thing we can share is the opinion: 1, On what we mean by architecture; 2, On our task in this profession in the current situation.

This is why, in school, we have been doing projects for monumental sites for several years now (often, these are very important sites and we tackle them without any false, reverential awe). For example, we have created this type of project in Pavia, Vigevano, Mantua and Verona. And we always seek a direct relationship to the antique building, to the monument. We have always selected monumental buildings or complexes which still appear unfinished, for one reason or another. Either they lost their completeness in the course of time or particular historical events left them incomplete (this is frequently the case with antique buildings: the Ducal Palaces in Vigevano and Mantua, Verona's Gran Guardia' and Roman theatre, etc.). These are monumental buildings or complexes which still have not found answers to all their questions, which still - or once again - present some unsolved problems; in other words, they still are projects.

In this fashion, the student's projects become part of a job that was already started, so to speak. And this work is older and more authoritative because it already has passed a lot of tests. It has come down to us with its own specific practical problems: it is an architectural work that has already provided its response, but it still is open to new solutions. In any case, it is an old design that is there for everybody to see, showing the complete set of problems that a scheme must always find the answers to: the entire set of problems. Fundamentally, the
problems are always the same. Thus, the new design that is added on is not allowed to avoid or omit any of them (like *decoration*, for example). If it does, the project has to openly and knowingly take responsibility for doing so (like, for example the artifice of omission). The presence of an old building does not offer an alibi or guarantees for these projects; on the contrary, it reveals all their inconsistencies. It also reveals the huge distance that actually separates the two, including the impossibility of blindly copying the antique forms. This is precisely what the project’s task is: showing all this. And, by making this direct comparison, it is supposed to reveal how provisional and objectively incomplete its response is: *these are architecture’s current conditions*.

Things are not different in my practice of the architectural profession: if I were to discuss my projects I would say the same things. However, I would like to add a few remarks on the particular direction my designing has taken and on where it stands, you might say.

Given the situation (but my interest probably plays a part too), for some time now my field of investigation has been becoming smaller instead of expanding to include, for example, the wide variety of possible solutions offered by contemporary architecture. Instead, it gets smaller and smaller, embracing the responses that have already been given, the most frequently used and usual answers. This is the field of the customary, the field of the *obvious*. This is the field I have chosen. There are probably many reasons for this, but one of them is quite simple: after years of experience, I came to realize that it is the most promising and open area of investigation. In any case, it is the only one that offers the right conditions for intelligent (and intelligible) solutions. In other words, I have concluded (though I am by no means a pioneer) that rigorous research carried out on what one believes one already knows, on what one imagines to be already familiar and obvious, leads to more surprises, so to speak, to more possible and unexpected viewpoints than letting one’s fantasy run wild. What really counts is just the point of view, the eye that does the looking (this is probably so in every field, but it certainly is in ours, because, above all, it is *seeing and transferring things*). If we succeed in looking at the projects and buildings clearly, without prejudice, *virtuously*, then the more normal looking things necessarily reveal links and obstacles (i.e., help, encouragement and advice) where we would least expect to find them. This is why my architectural investigation has sought to go *deeper*
and deeper (to be more obstinate, more cautious, more limited, etc.) instead of farther afield (i.e. experimentation in every direction). Naturally, this has had some rather important practical consequences (imposed limits, simplification, rigidity, etc.) and it has met with some disapproval at times. For example, I have been chided for being artificial, dry, predictable, plain, etc. as an architect (some people have even used the term 'aphasiac'). But, as I already mentioned, above all I value clearness in my projects: at this point, what matters to me is, first of all, making my viewpoint clear and making the reasons behind it as easy to understand as possible. Nor am I interested in facile, immediate approval; if I do get it, I prefer to obtain it after some effort, and those who are doing the judging should have to make an effort, too.

What I want to say is that as time goes by, the work I do heads increasingly away from spontaneity and variety (this is almost independent of my plans, if not of my enjoyment). So it is no problem for me to admit that my way of doing things really is redoing (the truth is I think this always is the case, and architects are more or less aware of this); I repeat things that have already been said. I dwell (and always have) on this point because I also have to admit that this redoing is precisely what I like best about being an architect: i.e., testing once's ability, I mean trying my hand at answers that have already been given, testing them again in my schemes, which do contain new problems, but without ever drifting far from them, without ever renouncing these responses' precise limits and extension (or virtuality). As a matter of fact, it seems to me that this is the only way of saying things left, the only one which allows us to have a partner in our conversation.

This may partially explain a certain degree of slowness (more or less imposed) which has become a constant feature of the way I practice my profession. I believe, however, that this slowness derives above all from the fact that my designs deal with well-known things, things that border on the obvious, commonplaces. I think it originated in the initial refusal that we instinctively make of the banal surface that always covers the more usual things, those we believe we know better; it conceals their real nature, the truth: the condition of need that generates their form.

Given the situation in our profession, it takes time to rediscover the truth, wisdom and mastery that are preserved in the most common things (for example, in the elementary form of the house and its components, like the form of the roof, the
door, the windows, etc.). You have to linger, withhold judgement for a while, examine things intelligently and calmly (you may even have to do more than one design). But the thing that counts always is the viewpoint and nothing else. I do not believe that there is any real alternative to this approach (within the craft's continuity, of course), except for academic designing. Just think of the house, that relatively simple object that has survived almost intact the passing centuries (except for this one, the scene of fierce formal experimentation). And look at two parallel ways of tackling it, both opposing that experimentalism with the same confident reference to constructional tradition: Schmitthenner's and Tessenow's for instance. One must admit that Schmitthenner, with his mostly nostalgic view of order, ritualism, etc., applied to the traditional bourgeois house (i.e., his substantial formalism), keeps repeating himself in his numerous subsequent designs. Tessenow, however, with his undeceived, free virtuous view of the same elements succeeds in bringing out apparently forgotten aspects of that tradition: sincerity, truthful forms, their raison d'être. And each time the result surprises us because of its authenticity.

Now I am going to briefly say something else about my designing: it may be important in a general sense. Looking back at my works from a distance, I realize that they consist totally of responses to questions and to chanced circumstances. This is true of all my projects. Without those questions, those circumstances, without those stimuli, those responses (which to me seems closely tied and interdependent) would not even exist. (Take, for example, the decisive nature the project for the Abbiategasso castle took on - because it was a castle - in the typological approach I developed from then on). What I mean is, judging from my own personal experience, one does not really get to the bottom of things until necessity obliges one to do so. I mean necessity makes us discover things, but the same necessity makes us discover our real interest in those things, too. Necessity regulates our attention, adjusts our way of looking and even makes things change (at least for us, since we are examining things from a different viewpoint). I could give you lots of examples from my own personal experience. For instance, I recently reflected on Roman architecture (on the Romans' construction techniques) before and after the work on the Sagunto theatre. Another example is my reflection on the European city's Gothic-mercantile architecture (one of my old favourites) before and after the recent projects for the city of Groningen. I want to underscore the crucial nature of those moments when I was obliged to reflect, and the
surprising expansion and transformation of the object of my thoughts. In short, I mean that grappling with some new tasks forces us to see things that we would not have seen otherwise. This should help defend us from the deceptive charm of design freedom (I want to repeat this: what counts really is just the viewpoint, and this has to suffice for every legitimate desire to renew architecture). I believe that design freedom is what we have to do our best to steer clear of, using every means and every trick to avoid it. Why? Because design freedom keeps us chained to what we are already, to what we have already succeeded in saying; it may keep us tied to what we love the best, i.e., to what we have already made use of, but that is the same thing. The reason is that design freedom prevents us from moving forward.

There is one last thing. In what I have said so far, there always is a relationship to the conditions surrounding our design work, some of them more technical and others of a more general nature. This is our projects' relationship to their surroundings, to their milieu (to use a term art historians love).

Our projects deal with a well defined situation (or milieu) and, starting form there, we construct a working method that seems right to us given that situation (the one I mentioned earlier which drives us to work in a certain direction). This does not, however, eliminate this situation, it remains to condition us, so to speak, a second time. (We must take account of the fact that the working method we constructed for our use is not general at all: there is a wide variety of methods, some very different from the others, and their effect on our milieu differ greatly). Roughly, this occurs in two directions. One concerns what we do directly, physically: every project, of course, transforms something that came before it, but it also modifies something around it. For example, every project relates to the site's characteristics, to what surrounds it and influences it: it comes to grips with the site's positive characteristics (now I am not going to talk about the construction of the projected building, since this is part of our profession's very practice). But the project also relates to the site's negative characteristics. (These stimulate the project's critical role, its desire/duty to offer an opinion at all times: for instance, on what the city is like, on its contents, on the ugly city, etc. I have already talked about this: for example, when I explained the goals of the Chieti students' hostel in relation to the city around it. I could say the same thing about the recent scheme for the Gavà city hall).
The other direction I mentioned is what the others are doing around us, with us (the others in our profession). We could ignore it (this is what happens most of the time), but I still think this is wrong.

We have already talked about the individualistic and purely experimental nature of contemporary design work (in spite of the huge changes that have been made as a whole). This is why our choice has to be more radical, so to speak. We want to disagree, so, in our projects we insist on known things, the apparently most obvious things: this is because, theoretically, one should not be able to interpret them differently. We do not do this because we want to stand out, the opposite is true: we want to compare our response to the others', to test it this way. Competitions limited to invited architects are an unusual case; here, we have the fairly unique chance to regulate our response according to what the other foreseeable proposals will be, we can make ours more explicit compared which what we imagine the others will be like. In these case, our answer always has to be more radical than in other cases where there is more freedom, i.e., the brief is less stringent. Consciously or unconsciously, we always choose the most instructional, the most radical response. (I wonder if we can still use this word; for instance, there is a group called 'Radical Architecture' which evidently as other things in mind).

Last year this happened to me with the two schemes for Piazza Matteotti in Siena and the design for the Venice Biennale pavilion. In both cases, I believe, the proposal in itself was less important than the fact that it was exemplary in relation to what one wanted to state (this is the right way of understanding the subject). The same thing happened with the Bovisa project for the XVII Triennale.

I always did like Hilberseimer's Chicago Tribune design very much (this, too, is a fairly radical scheme, since he proposed two skyscrapers instead of one); his description is completely based on the other submissions, on the more predictable and exemplary ones (Gropius, Taut, etc.). I like this description even better when I compare it with the autobiographical, poetic, and other types of architects' reports that we usually read in our journals.

Today's situation shows us an abundance of formal slogans. History repeats itself: yesterday it was the flat roof (the famous roof war), today we have much more to chose from: the redundant use of technology or the crude use of classical orders, updating the Modern Movement's stylistic elements or pointed roofs and flags, and
so forth and so on. (Here we have to briefly mention, since the debate only gets fierce when someone claims to be original, that these *slogans* can legally belong both to the inventors and to their imitators. In fact, as Karl Kraus said 'There are some forerunners who imitate the originals: if two people have an idea, it does not belong to who had it first, it belongs to who had it better'). Moreover, we must not forget, as Kraus always used to say, that 'Modern architecture is something superfluous created on the basis of the correct acknowledgment of a lack of need'.

Thus, everything can go back to pretending to have a purpose, even the apparently stupidest and most futile experiences. All this may depress us, scandalize us or leave us cold (like the public does, for instance), but the fact remains that those who now have no doubts about the usefulness of defending one set of short-lived *slogans* or another, and have no intention of playing this game, may have only one way out. I mean *negation*: good, old, inoffensive *negation*. (Perhaps there never has been such an opportune moment for repeating Kraus's remark: 'If someone has something to say, let him step forward and keep quiet!'). Therefore, they will continue their quest, conducted with these (very) limited tools, for a *normality* that is increasingly hard to recognize among the myriad distractions.

However, we have to take account of this aspect of the practice of our profession which forces us to participate in this absurd conflict of forms. Otherwise we would also be denying the *condition* we value most highly in our design work, the one which surely is lost but still *necessary*: a comprehensible language, a common, shared language for architecture (its very definition). I believe this is why we cannot do without keeping track of what others in our profession are doing; this is why we always have to measure ourselves, to express an opinion every time - in our own projects, of course (so even *negation* must always be a kind of waiting, a willingness to take part in the contest). The reason is that, in reality, this is our last link, it is the only possible point of departure left that we can use to push off in our quest for a common meaning for the practice of architecture.

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This text appeared in *Domus* no. 714, March 1990 'Un parere sulla scuola e sulle condizioni del nostro lavoro'. The text is based on a lecture given at the School of Architecture of the University of Florence on 15 December 1989.
Public library, Groningen
GIORGIO GRASSI

One should keep in mind, first and foremost, that this is a central library, that is, a library serves as the headquarters and point of reference for all of the libraries in the region, and therefore the building contains, besides the library itself, offices for reporting, forwarding, exchange, and so on with the peripheral branches. The area chosen is in the heart of the old Gothic market town near the Grote Markt on the Oude-Boteringestraat, perhaps the street that boasts the largest number of old buildings in the city. It is a roughly square block (approximately 60 meters per side) which includes within its perimeter four Monumenten all facing the Oude-Bo teringestraat (number 10, 12, 14 and 24), four historic buildings that must be preserved.

Each side of the block presents a different architectural situation. An ancient road running into the city, typified by an orde **ccession of facades of old bourgeois homes (Oude-Bo teringestraat). A small lot road bounded by the side facades of more modest old houses (Poststraat-Zuid). The same street at a 90 degree angle, bounded solely by the side facade of the new Universiteitsbibliotheek (Poststraat-West). And, lastly, a short stretch of road (Broerstraat) which rapidly expands to establish a space of particular architectural value, a space bounded by monumental buildings that, beginning with the Oude-Bo teringestraat, progressively opens out until it becomes a full-fledged plaza before the Academiegebouw (Academieplein).

The first problem that this project has to deal with is general in nature and concerns the establishment of a public building of considerable size in one of the most evocative blocks in the old town. The blocks here are typified by an extreme homogeneity of construction (ground area occupied, shapes of the lots, width of the facades, height, etc.) as well as in terms of architectural solutions (houses with 'three windows', the materials, the resolution of the street-level entryway, the roofing, and so on).
The problem is thus one of the meeting point between an exceptional theme and the typical character of buildings in this city. The problem is particular evident on the Oude-Boteringestraat (where the main entryway of the library is planned), i.e., where the chief facade of a large and official building must fit into an homogeneous fabric of buildings, made up of narrow and regular facades. Not that there are no other instances of this sort in the old town (in the Oude-Boteringestraat just a little further along, on opposite sides of the street, facing each other, there are two clearly alternative solutions: one with a large central portal and a square inner court and another with a narrow, elongated courtyard, open on the street, which establishes a perspectival axis perpendicular to the street itself), but the situation nowadays is certainly different from that of another time. Suffice it to consider the difficulties linked to the question of the recognizability of a public structure today, in terms of figuration, with respect to the experience of the old city.

Subsidiary to this overall problem are two other, more specific problems concerning the project and its development. The first problem concerns the typological approach, and therefore the entire question of volumes of the building in relation to the programme of a modern central library. The second problem concerns the spatial relations that the new building establishes with its more immediate surroundings, with the Monumenten and with the surrounding buildings, and especially where the height and the occupation of ground space are concerned: relationships that shift on different sides of the block, as we have said at the outset. Clearly the two problems are closely linked one to another.

The first problem has been resolved in this project in exquisitely volumetric terms, that is to say, by emphasizing through the articulation of the various structures the different uses of parts of the building - by separating the building structure of the library itself (reading rooms, stacks, and so on) from that of the offices and general services, connecting them at the end by a third, extremely narrow transversal structure, likewise volumetrically quite specific, intended to contain all of the vertical and horizontal links.

The articulation of these three structures one with another, and in relation to the Monumenten among which they have been placed, especially on the Oude-Boteringestraat, give rise to a rhythm of solid/space that is none too frequent in streets of this sort, though it is adopted at times for buildings of an unusual nature (see the
example mentioned in the same street), and in any case, a rhythm that fits perfectly with the characteristic division of ground space in the street itself. In the plan, the facade of the block on the Oude-Boteringestraat appears on the side of the Poststraat with the succession of three Monumenten (numbers 10, 12, 14) followed by free measure of a lot (4/5 meters, corresponding to the service entry of the library), and on the side of the Broerstraat with the most important Monument in terms of size and appearance (number 24), followed by a free space of just over two meters (with the approximate value of an old Bauwich). The chief facade of the library stands between these two series of measurements that are so different; in turn it is made up of two identical structures (7 meters) separated again by the free area of a lot (8 meters). This free space on the interior of the volume of the library, a narrow and deep open court, constitutes its main entryway, while at the same time representing the perspectival axis on which the entire architectural figure is based - this axis in fact extends for the entire depth of the block, partially interrupted only by the double order of the entry portico. In this way, the broad free space between the Monumenten numbers 10, 12 and 14 and the Monument number 24 is entirely occupied by the articulated volume of the library, though in reality only the two longitudinal bodies with 'three windows' reach the edge of the road. And from the road, through the three intervals, it is possible to see all of the constituent elements of the new building complex (the structure of the library itself through the service entrance, all three of the building structures through the chief entry and, through the narrow opening of the Bauwich, the garden and, in the background, the linking structure).

The other problem to which we referred, concerning the relationship between the building and its immediate surroundings, has been treated in terms, so to speak, of analysis; that is, case by case, side by side. We have already said, in reference to the facade facing the Oude-Boteringestraat: this is the principal facade, a perspectival axis bounded by the three structures of the building. Here the public building directly overlooks the road without contradicting its original measurements and architectural character.

The facade lacing the Poststraat-Zuid shows the lateral bulk of the principal structure of the library (here one floor lower in order to reflect the runoff line of the smaller street); a few design detail allow one to detect the L-shape in the point of contact between the three Monumenten, and on the other side, the connection with
the transversal structure of the linking body. The facade facing the *Poststraat-West*, occupied along its entire length by the linking structure, is clearly a rear facade. It is a closed facade, and it reiterates, in a canonic fashion, all of the compositional elements of the market buildings of the old town (the small windows, the cargo door, the winches, and so on, of the old *Pakhuizen* of the city).

Lastly, the solution applied to the facade on the *Broerstraat/Academieplein* is chiefly a result; the result of a reciprocal deployment over the area of the block of the functional structures. Nevertheless, this solution - which also entirely isolates the *Monument* number 24 (accentuating its already considerable degree of monumentality) and the formation of a garden, open to the public space - in the end proves to be appropriate and in line with the architectural characteristics of this space, rich in various episodes.

I conclude this brief description with a final observation that concerns the first, most general problem. It is true that the principal problem faced in this project was that of inserting a large public building into a close-knit, regular fabric of constructions. It is further true that this problem was resolved in this project chiefly in the sense of mediating the conflicting scales, rather than in any sharp counterpoint between the two different sizes: though not to the point of concealing the problem itself.

In reality, the objective of the project itself was always to allow the tension to appear, to reveal the disparity in expressive terms, between these two compositional elements. That is, the problem should have remained open, even after receiving an answer. And in this sense, the design should have revealed, along with the answer, its evident difficulties - that is, the conflict, which is the initial point of departure, along with the particular form that this conflict takes on in an effort to apply the architectural lessons that is here offered by the old town (in order to offer a different example: in the nearby *Universiteitsbibliotheek*, the problem, or at least the same problem, does not exist, inasmuch as the construction does not show this problem). All of this is solely to say that the response in this project is not and is not intended as a response of a mimetic sort. All of this to explain better, for instance, the role in the project of the open spaces in the structural wall of the *Oude-Boteringsstraat*. Even if these empty space at first glance seem only to negate the idea of a curtain wall, in reality, in their alternation
of new and old structures, they perform instead the task of allowing this
characteristic tension in the design to appear clearly - and this is precisely its
problem. From the operative point of view, those spaces have the same
architectural value as the volumes to which they correspond, they are, that is,
elements that are necessary in the composition of the project.

The ensuing relative isolation, therefore, of the *Monumenten* with respect to the
new structural complex should be understood in the same sense. We know
perfectly well that the condition of the old city cannot be recovered, and that a
project can at the most hope to make use of the old city's teachings, but must face
other problems, and respond to different questions. It is this observation that
shows us that the way in which the *Monumenten* belong to the new block cannot
be anything but new and different. And this is true, point by point, in the project, to
the degree that in the end we realize that it is they that join the library, and not the
reserve.

In the project, the *Monumenten* stand against the blank walls of the library
(numbers 10, 12 and 14) or else are so close that it is as if they touched those walls
(number 24), they joint that wall, and in so doing, take on the bulk of the task of
mediating with the architecture of the street that the project must complete. To the
point that they appear to be part of the new structure, a very important part
because in the end it winds up influencing in a decisive manner the structural and
decorative decisions of the entire complex.

Having said this, it becomes clear that very few of these decisions can be attributed
in an autonomous fashion to the library building itself: almost everything was
determined in the encounter with the *Monumenten*, and thus taking them on as
active parts of the structure. With respect to the construction as a whole, we can
perhaps recall here only that the structure of the new building is modular and
utilizes for the most prefabricated components, that the curtain wall is entirely
made of brick, visible to the passerby, that there are only two types of external
windows (large or small windows in wood painted green or white), and, lastly,
there is only one 'unique item' in the entire complex, that is, the structure in white-
painted wood of the double-order portico which stands before the main entryway -
the only concession to the 'celebratory' character which goes beyond the
suggestion of strict expressive economy offered by the four *Monumenten*. 
Situation with elevations
Elevation on Oude-Boteringestraat
Elevation on Poststraat-zuid
Elevation on Poststraat-west
Elevation on Broerstraat
View from Broerstraat/Academieplein
View from Oude-Boteringestraat
Elevation on Oude-Boteringestraat
The Roman theatre of Sagunto under construction
On the present state of the ancient building

At present, the theatre of Sagunto has, to a large extent, the appearance of an artificial ruin. What I mean by this is that a large part of what is most evident to the visitor really belongs to more recent efforts at restoration and reconstruction of the Roman structure.

Some of these efforts were motivated by an understandable desire to shore up the ruins, while others were the result of a much less clear attempt at partial architectural completion of the monument. As far as the outcome is concerned, the latter are by far the most obvious and lend themselves to a number of observations.

The most general observation that can be made is that this work of completion (of a mimetic character) does not seem to have had the most faithful possible restoration of the theatre to what it had once been as its goal (as on the other hand had probably been the aim of the archaeologist), but rather it is as if the ruin itself had been the objective; that is to say, the image of the theatre in ruins just as it was, perhaps accentuating its picturesque characteristics. There seems to have been no concern for recreating the idea of the Roman theatre and its distinctive features (in doubtful cases: approximation to the Roman theatre by similarity and comparison with other contemporary examples and/or reference to the canonical elements of the type).

This fundamental choice has meant that the present appearance of the theatre is, when all is said and done, false. The fact, for example, that work has been carried out exclusively on the cavae (where to tell the truth reinforcement was more necessary) as if was to all intents and purposes a 'separate part' of the complex of
buildings, has resulted in a strengthening and a confirmation of that Greek form of theatre carved out of the hillside, with a view across the plain etc., which had already misled a number of historians in the past when confronted with the original and still intact ruin.

But this is not all. The architectural arrangement of the block of the stage with its characteristic shape, doubtless dictated by the topography of the site, a shape that is vague only in front view, has been distorted, or at best eluded, on at least two occasions (although not as a result of direct interventions; apart from the paradoxical case of the present position of the proscenium, so arbitrary and inexplicable that it is not even worth taking into consideration).

A first time when, with the construction of the small museum up against one of the two towers, with the terracing, paths and surrounding stone wall connected with it, the symmetrical shape of the stage facing out over the lower town with its two characteristic jutting towers was completely destroyed.

And a second time when, during the work of restoration which involved strengthening and completion of the cavae in correspondence with the paradox, it was decided to cover the whole outer face of the pediment wall of the cavae with regular courses of square stones. This had the result, as far as the ruin was concerned, of making it look like an outer wall of containment for the cavae and not, as it really is, the wall which the cavae and the versurae of the stage have in common, i.e. that wall which unites the stage to the auditorium and makes it into that architectural unit characteristic of the Roman theatre.

**Working objectives and general criteria**
The hypothesis described above envisages, where necessary, reinforcement of existing structures, or their liberation (as in the case of the aforementioned museum), and the partial completion of outstanding ancient wall structures, with a view to making the complex of buildings that make up the Roman theatre more comprehensible. This would involve making it easier to distinguish its different parts, the relations between them, their hierarchies, individual roles etc., and lastly the way in which they come together to define an articulate and complicated architectural form, but one that is still absolutely unitary. This is in fact the type of the Roman theatre over the brief history of its construction and throughout its long
and constant influence on the history of architectural forms. Also envisaged is the reconstruction of those essential parts of the theatre's structure that are necessary to convey a clear idea of the architectural space of the Roman theatre of Sagunto in its entirety. Yet this will be done with respect for the archaeological remains, indeed on the basis of the present ruins, including the modest historical overlays (in this case: the completions, even the most recent and questionable ones) that are not in glaring contrast with the specific quality of the space whose restitution is aimed at, that is to say with its characteristic unity.

The spatial unity of cavae and stage equipment, the chief feature by which the Roman theatre may be identified on the plane of its architecture, consequently becomes the prior objective of the intervention hypothesized here.

Hence reconstruction will have to mean primarily the completion of the principal building structures of the Roman theatre, of those structures which are essential to its identification as such. But this completion will be carried out according to a principle of strict economy (an architectural lesson which has in fact come down to us from the building practices of the Romans). By this is meant using the minimum of means to do what is indispensable on the plane of architecture in order to attain the set objective, which is in fact the Roman theatre of Sagunto, in all its uniqueness, but also in everything that reveals it to be the expression of an extraordinarily rich and effective type of building.

This signifies that the project of restoration and historical restitution cannot help turning into, to all intents and purposes, the design of a Roman theatre ('in the style of the ancient Romans'). In other words, the design of a partially new theatre building founded both on the existing structure (literally, materially) and on an established building pattern whose condition of necessity (utility and function in the broadest sense) is wholly contained within its fixed form. A project, that is, which intends to take from the ancient structure every trace, every hint, every working indication, but above all its general lesson of architecture, seeking to carry it on with consistency.

In such a way that not only its proportions, relationships etc. will derive from observation and study of the ancient structure, but also those choices of technique, function, construction, decoration etc. that become necessary over the course of
the work, will have in the ancient structure and in their relation to it their sole raison d'être as architecture.
All that has been said so far naturally implies recognition of the fact that the Roman theatre is also something that goes beyond its mere form, that it is also a definite type of theatre. A type of theatre, i.e. an idea of theatre, surely still very conscious of its ritual and evocative purpose etc., of its being a collective moment par excellence, like all ancient theatres, but also increasingly open to change, ever more fertile and spectacular, through the extension of themes (the closer and closer relationship with everyday life), the development of technical, scenic and interpretative possibilities (from script to rough draft, to improvisation, and so on), a theatre already very near to that concept of theatre which belongs to our more immediate past. This is how the practical aim of our working hypothesis should be understood, as that of constructing at the same time a modern and perfectly functioning theatrical space.

A theatre in the style of the ancient Romans, as we put it earlier, also means an expanded range of possibilities on the plane of drama, to which the building responds with an ever more broadly evocative attitude and with a consequently greater adaptability. The great cavae and the equally high body of the stage facing each other: the uncovered tiers, the fixed stage installation, the immense stage front, itself spectacle within the spectacle, the very high versurae merely as linking element, the great overhanging wooden roof. Primarily all this establishes an image of a highly spectacular nature, but it also indicates expectations, modalities, fixed times and roles and above all a great theatrical flexibility, enormous versatility in fact, which will have to be taken into account in our proposal for work.

In any case there are now a large number of ancient buildings which are used quite normally for performances and, inevitably and in relation to their state of preservation, the building's architecture comes to play a more or less integral part of the dramatic action. Much as happens in other types of theatre besides, such as the Teatro Olimpico di Vicenza, the one in Sabbioneta, or the Teatro Farnese in Parma (another place where the problem of reciprocal adaptation is always being raised).
The stage front

It is certain that among the characteristic elements of the Roman theatre, the stage installation with its immense front, precisely because it is the imaginary place par excellence of dramatic action, an element which does not cease to astound us with its size and resources, is the most difficult to adapt to the theatrical function to which we are accustomed and tend to relate to today. It is just its incredible excessiveness and its so frankly spectacular purpose that gives it its extraordinary fascination, but it is also what underlies its insurmountable difficulty (it suffices to think of the wall at Orange or the architectural fragment of Merida or Sabratha).

In fact fixed scenery (which is to say, let us not forget, architecture), 'abstract' prop for different dramatizations, is in itself a recurrent feature in the history of the theatre, and even in contemporary drama. It is enough to think of the role of architecture in practical and theoretical theatrical experience, of somebody like Appia (Copeau pointed out that "...Appia's fundamental idea, i.e. an action in relation to a piece of architecture, ought to be sufficient by itself to make us produce masterpieces..."), or of the now mythical permanent scenery in Copeau and Jouvet's Vieux-Colombier, and of many other examples, to realize its great importance to theatrical research and experimentation.

But the stage front of the Roman theatre is something else again. In the first place the stage front is an absolutely inflexible object (it cannot stand 'stylizations' or simplifications). The stage front of the Roman theatre can only be taken for what it is, a place of the imagination, a formal idea in which theatre and architecture are completely confused, all the more 'fiction' in that neither the one nor the other is expressed in it in their own specific manner. The term 'decoration' for example soon reveals itself to be totally inadequate, far too simplistic to designate this incredible collective idea put forward at a precise moment in history and never again recovered in its entirety, in all its figurative complexity and conceptual clarity: an unshakably necessary element of Roman theatrical space.

And, for us, great, complex and inflexible architecture that can only be taken as it is; totally indifferent to whether or not we are inclined to construct architectural systems of this sort.
But, as has been said, the stage front is also fixed set, permanent scenery. It is not just this, but it is also this: its function is that of a fixed set. And as such it is an abstraction, in this particular case a sort of allegory, a heraldic rendering of something else. It is a convention that the three gates indicate the palace and perhaps the city. Is this why the stage front is confused with gates and triumphal arches? Or with other equally enigmatic features like the nymphaea or 'septizonia'?

We know that the great central opening was called the 'regia' and the side ones 'hospitales', and that they are there to mark necessary spaces, to indicate symmetries and hierarchies. And the 'valvae' onto which they open confirm and multiply these symmetries and hierarchies, expanding space by dividing it, adding depth, the dimension of perspective, illusion and ubiquity by hinting at always different places (which would later become the 'appointed places' of sacred performances, while those same openings would give onto the new perspective views to the Renaissance theatres).

This is the complex role of those few and essential elements of composition of the Roman stage front and it is also what makes them useful: they are the only functional element which appear on the proscenium, the only ones which are used in the dramatic action.

Then there are other doors too, doors and windows, openings and passages of various kinds, which stretch upwards in vertiginous layers. But out of all these only the ones that belong to the lowest layer, the ones in direct contact with the proscenium, play a role in the action.

So one is tempted to ask what the rest is for. And with a certain amount of surprise we are forced to acknowledge that, while everything that belongs to the lowest order is useful, everything above it is in reality necessary: splendid, glaring, contradiction of the Roman stage front!

Everything that is useful to the dramatic action, i.e. that takes part directly in the action, is in reality not necessary to the action itself, while all that at first sight seems extraneous and superfluous, because it does not form part of the action, is actually needed in order for that action to be able to expand (literally to echo). Its
task is to maintain the tension of the dramatic action intact right up to the last tier of the *summa-cavae*, and to convey it steadily to the place, making it into the place's own tension (that which in fact makes the experience of the empty theatrical location into the unique and irreplaceable experience of which Jouvet tells us).

Just by standing there the stage front fulfills its task in a manner that is direct, material and constructive in the strict sense of the word, in perfect accord with both the real building and the imaginary place that it represents.

Its role is indispensable because in reality the Roman stage front acts theatrically on its own: simply by displaying itself.

Our hypothesis will certainly take into account that part of the stage front which we have described as 'useful', but it will not in any case be possible for us to ignore what we have acknowledge to be the 'necessary' part of it.

We can easily reconstruct the so-called useful part of the stage front, i.e. the part resting on the proscenium. Indeed we can stylize it, by making it abstract for example. There is no difficulty in doing justice to its principal components: monumental doors and stairways, exedrae and railings are all 'neutral' functional elements, as suited to the fixed scenery that we are going to set up as the completion of the few archaeological finds available to us.

But with the upper part, that incredible architectural installation which is the stage front in all its height and splendour, we can only attempt to come up with an approximation.

We can do no more than hint at its decisive role.

But how can we do this, today, when we are declaring at the same time its irreplaceability and irreducibility. How can we do it, except by materially demonstrating its impossibility, that is to say its absence.

This is our problem and this is its contradiction.

But it may also be that the way out (on the technical level, as well as the methodological and conceptual one) lies here, right within this very contradiction.
The wall of the postcenium

For instance. If we decided to break (literally, materially) the 'magic box' of the modern theatre, the Italian-style theatre, overstepping its mysterious boundary, if we propose to open up the box materially so as to provide a glimpse of what lies behind, the life that goes on behind, the other face of the stage front, the wall of the postcenium, to reveal all its mechanisms and artifices, so that it too acts as a place of the imagination, spectacle within spectacle, are we not in sense doing something very similar to the role of the stage front? For the latter too can be seen as a spectacle within a spectacle, as a redundant extension of the fixed scenery, a heraldic offshoot of the dramatic action.

And in this way would we not manage to attain the opposite effect at the same time, the other result we were aiming for, that of drawing attention to the lack, the absence of the stage front itself as a structural element of the dramatic action?

Would this not simultaneously demonstrate its irreparable ending, by revealing it materially as a ruin?

And again. It has been said above that the stage front is primarily an architectural system, an unusual system whose special raison d'être it is still possible for us to understand. But what is most striking about this stage front today? Its raison d'être, or its being an extraordinary sight in itself? Its character of necessity, or its appearance to our eyes as an incredible system of decoration?

So perhaps, in order to get as close as possible in our work to the world of representation embraced by the architectural system of the Roman stage front, could we not forget about trying to replace it with a different architectural system (an attempt that we already know is destined to fail) and see instead - keeping the problem of such representation on the level of its most immediate appearance (i.e. the eminently decorative and spectacular character of the stage front) - if it is not possible to replace it with a decorative and ornamental system that can be its equivalent at least on the plane of capacity for evocation.
The Antiquarium

In this connection it might be worth us taking a look at a practical, and far from secondary problem, which we are also going to have to tackle in our work. I refer to the need to dismantle the small archaeological museum that now stands against one of the two towers of the postcenium and find it a suitable location elsewhere.

The material on show in the museum comes for the most part from demolitions that have been carried out in the town centre in the past and consists of a number of exhibits of different size and value. Almost all of them are fragments of decorative elements: bases, columns, capitals, cippi, epigraphs, various pieces of statuary and lastly some large fragments of mosaics that are of considerable interest.

If we go on now to look at the narrow block of our theatre’s postcenium, we can speculate that only that part of its high vertical section which is in direct contact with the proscenium will definitely be used by the technical department of the theatre, perhaps along with its very top, at the height of the large and accessible truss of the roofing, which would be used for artificial lighting.

This means that the whole of the middle part of this section could very well be used to house the new archaeological museum. It could extend along the whole longitudinal section between the two walls and over the whole surface of the postcenium wall that faces the auditorium and is not involved in the dramatic action.

Of the two possibilities, what interests us most is of course to investigate that offered by the enormous surface of the postcenium wall. We can already picture it as a sort of large and composite trophy, a kind of immense retable: an ‘Antiquarium’ which would not only be particularly suggestive when viewed as a whole, but also be especially suitable for examination of the larger exhibits, such as the mosaics.

Part of the fixed scenery could also be used in this way. Made up of a wall as high as is needed for theatrical performances (and therefore quite openly a ‘fragment’), extended along the line of the ancient stage front and interrupted at the centre of each exedra to leave space for the three canonical openings, the plinth of the fixed
set could be used to accommodate the largest architectural fragments (such as columns, capitals, trabeation etc.) that would be able to recall the architectural composition of the Roman fixed scenery with more immediacy.

Then, seen from the auditorium, the postcenium wall, literally covered with large decorative elements, might reappear from behind the curving wing of the fixed scenery, a little like that splendid, fabulous and thickly decorated wall of the stage front that we are accustomed to seeing in the illustrations to old books of art history.

In such a way that postcenium and fixed scenery will both bear witness to the simultaneous splendour and ruin, to the presence and at the same time impossibility of ever existing again of the ancient stage front of the Roman theatre of Sagunto.

Other questions about the project
The hypothesis put forward here with regard to the use of the stage block and the way in which to solve the architectural problem of the stage front certainly does not exhaust the many questions which are raised by a scheme of utilization and architectural restoration like this one. Yet such a hypothesis also indicates a more general line of approach that is sufficiently clear, I believe, on the level of method to be extended to other problems raised by the project at the same time.

In essence, it is a line of approach which does not intend to lose sight of either the complexity and wealth of problems that are faced, or the objective limits of the means at its disposal. An approach that has no intention of evading either the specific nature of the problems of expressive language that are crucial to the architecture of an ancient building like this one, or the objective difficulty of architecture today when confronted with these very problems, its paradoxical lack of preparation and inadequacy. It would be absurd if we wanted to tackle such problems in a direct, linear fashion: we cannot pretend to be heirs of that language (only the most languid romanticism could delude itself into thinking so); it is enough to think of questions like that of the 'architectural orders' or of 'decoration'.

The crucial problems of architecture today are different; they are problems of meaning and form, bound up with the loss of a common language: it suffices to
look at the present state of architecture faced with the fact that it has always been 'collective act par excellence'. This is why I believe that architecture today can only seek to come up with responses that are consistent with its condition.

There is no other solution, it is clear. Nor can one deceive oneself into thinking that it would be possible to reduce all problems to questions of technique and practice, that is to say problems of construction.

In any case the solution put forward here for the stage front points clearly to at least one thing: that such difficulties must not be hidden or masked. The contradiction of architecture must remain unconcealed just where it reveals itself, i.e. in its response. Especially in the response (which is always a practical, material act in architecture). The response should always reveal first of all the tension of the contradiction out of which it has emerged.

The case of the stage front is undoubtedly the most obvious, but there are other points at which this work of ours contains a particularly large measure of the same kind of difficulty. For instance in the definition of the outer perimeter of the stage building: the boundaries of its volume, its completeness or otherwise, the degree of formal definition etc. And then comes the problem of its juncture with the cavae, of the continuity of the overall perimeter of the theatre, and so on.

In this case an unequivocal and conclusive response would actually be nothing but an evasive and false one, leaving things as they are. For example a reconstruction in style, a 'romantic' restoration ('as it might have been as it should have been'). Or, the opposite, something 'new' at all costs, something haughtily 'up to date'. What would be the sense of such a solution? What real change could it represent? What real new light would it throw on the ancient building (the ancient theatre: highest expression of the very idea of collective experience), if the present condition of architecture is really one of no longer being able to recognize itself in its history?

In architecture the response must always contain the problem. A good solution in architecture always throws light on the problem out of which it emerges. Its problem, its raison d'être. Thus, in the case of the stage building, a good response will contain, no matter what, the ruin, the mark of the ruin out of which it comes, on
which it is raised. And it will also always contain the mark of its own (technical and expressive) impossibility, a declaration of ineffectualness. I find myself asking how else can these two marks - the mark of destruction and that of the impossibility of reconstruction - coexist except in the latent and incomplete form.

It is the same as with the stage front: the response cannot but remain in a sort of precarious balance, an unstable equilibrium between these two states. And this precariousness must be obvious. I do not think that any other kind of answer is possible, except by feigning different conditions for the project.

Then there are other questions, just as important but whose difficulty, whose problematical character in the sense described above, is expressed in less harsh terms. Less dramatic ones, it could be said, above all since they are all questions sustained by strong practical reason (questions of distribution and use, or relating to techniques, materials, etc.). For the latter it will be sufficient if they satisfy a condition of formal consistency with the solution provided for other parts of more difficult interpretation. I mean to say that consistency with these parts will be largely a question of a tendency towards unity in the overall result.

Let us take the case of the auditorium. It will have to be restored: the tiers reclad and made fit for use, the steps and praecinctiones repaired etc. To be consisted with the other interventions, one possibility would be to restore only one part of it (even a substantial part, such as the central part of the cavae which is the best situated for theatrical performances), so that the ruin shows through here too, coming to the surface, and so that once again the architectural solution does not have the air of being definitive and settled.

The same may be said for the question of completion of the summa-cavae. Taking as a working objective the state of ruin in which the theatre was in at the time of Otriz and Laborde (before the demolitions of 1811, that is) and diligently recorded by them, could be a good solution precisely because at that date the ruin of the summa-cavae represented a sort of sufficient condition for recreating the architectural structure of the summa-cavae itself and of its containing wall.

Actually we are dealing with a choice of great importance to the project here, since it determines the maximum height of the whole complex of buildings. It fixes in
definitive fashion the maximum height of the stage block and the versurae, as well as the position of the top of the wooden roof covering the proscenium.

Finally a degree of importance will be attached to liberating the entire perimeter of the stage complex, at the level of the piazza beneath, from all those additional structures which prevent a clear view of the group, and which have been mentioned above. This also holds true for the selection of the most convenient points of separate access to the monument and its museum and to the theatre when it is in function. On the other hand, the details of the use to which the internal spaces of the stage block or those created in the underpinning (postcenium and towers) will be put will be dictated exclusively by considerations of a practical nature concerning the efficient functioning of a modern theatre.

**The annotated bibliography**

An annotated bibliography, or rather a series of indicative bibliographical sections and not an anthology, were attached to the original report of this project.

This bibliography (which has not been printed here) makes no claim to being exhaustive or scientific in character. Rather it is an ordered collection of a certain number of texts whose main task is to render the encounter with the theme of our work an increasingly conscious and persuasive one. Texts whose main contribution has been to establish what could be called the right climate (that necessary condition of preparation for work on the project that follows the phase of pure and simple accumulation of information), i.e. to the establishment of those conditions in which, without losing any of its specific characteristics, the theme ceases to be a distant, and exceptional fact. The theme becomes accessible, its outlines grow, in a manner of speaking, more familiar and a balanced relationship is re-established between the theme itself and the specific conditions of the work of design (all this was absolutely necessary, given the scale and the prestige of the theme tackled).

A bibliography that, while including it, goes beyond, or at least often strays away from the mere recording and critical organization of historical and archaeological data: (travellers' tales), the reports of missions, surveys, more or less scientific reconstructions, even guidebooks and above all the monographs on those theatres that became increasingly important over the course of the work, and so on. Reading them stopped us from feeling isolated, threatened, when faced by the
monument and the impartiality of historical data and archaeological finds (after all
this was still a work without many precedents). They made us feel as if there were
others like us, and in similar circumstances, who had set themselves the same
problem (even if they did come up with very different answers).

So this bibliography also represents the creation of a sort of 'spiritual family' (in the
sense that Focillon uses the term). A very heterogeneous family, it is true, whose
members are linked together mainly by a rare combination of passion and
profundity, of rigour and simplicity. The others include Caristie and Lanckoronski,
as well as Formigé, Guidi and Frezous.

In the best cases these works manage to break down that sort of intolerable circle
of isolation and secrecy which is very often the outcome of the work (although not
always the aim) of many so-called specialists, always jealous of their independence
and of the object of their work. This is always harmful, above all for the object itself
(especially when, as in our own case, it is a manifestly public asset, part of daily
life), which is thereby removed from the task that it is still intended to perform in
the life of the city to which it belongs.

Many of these books are monographs. In these cases the choice is also connected
with the desire to delineate a sort of model theatre, through the selection of a
number of theatres in particular and careful re-examination of the documents
relating to them (this was the case with Aspendos, Bosra and Sabratha): of their
particular state of ruin as it appears today (Aspendos, Bosra), or of historical
surveys (Caristie, Lanckoronski), or of hypothetical reconstructions (idem) or ones
that were actually carried out (Guidi). That is to say: the hypothetical reconstruction
of a medium-sized theatre, with similar characteristics to the one at Sagunto and
that might serve as a guide to a coherent architectural restoration of the latter.

Theatre of Sagunto, sections and plans
according to Laborde, 1811, reconstruction of
the summa cavae and constructive elements
according to Ortiz, 1807
Site plan, present state

Project site plan
Exterior front and side elevations
Section towards the cavae, stage front and transversal section
Views of the model
Cedric Price, Bat Hat, Battersea, London 1984
Autumn always gets me badly; first thoughts on serious things
CEDRIC PRICE

These talks were delivered in the long-held belief that cheerfulness is next to usefulness. Their stated subjects suggested the length of the step proposed, and not security of the intervening stepping-stone. Hyperbole was employed, in an attempt to render the subjects palatable to enfeebled architects and jaded politicians. Translation from the spoken to the written word destroys immediacy, but enables reference. The music played at the live delivery consisted of 'Take Five', by MJQ, and Ravel's 'Bolero'. Primarily, these chats were a MANIFESTO in the making.

The end of the eighties found architecture, particularly in the UK, gaudily superficial not only in appearance but also in the quality of discussion. Confrontation with issues of housing, planning, technology, social awareness and the construction industry has, over the decade, been enfeebled. While the causes of this dilution - if not avoidance - of commitment are open to question (my biased opinion is that short-term greed has a lot to do with it), the consequences are not. The initial result has been the profession's avoidance of involvement with concerns such as environmental decay, global imbalances, and disasters planning. In the longer term, those in other disciplines who are still constructively concerned no longer consult or co-operate with architects. This widespread recognition that the architectural profession has become an intellectual clique of little use to society is being rapidly absorbed by the profession itself, which in turn attracts as members those who enjoy impotence.

The manipulation of space to create beneficial conditions requires that space be regarded as a commodity in itself, and not merely a by-product of enclosure. This definition demands that spatial content - primarily, but not always, air - be, in its semi-captive form, exploited to the full. The comparative advantages of fresh air
and 'conditioned' air, or natural light and artificial light, are some of the resultant equations needing resolution. Movement through a building obviously need not start and finish at the same point, nor need the behavioural use made of such a journey require any symmetry of accumulated experience.

'None of these projects has a centre. Centrality in architecture - more albatross than touchstone - demands of the user an acceptance of balance occasioned by a classical formalism'.

'Architecture as a process geared to the future will generate a series of 'intervals' (buildings) frequently off-balance'.

'A wheel when moving is a visual smear; when static it is redundant'.

**Homes and houses**

Housing, when judged by its end-product, the house, has always been of the wrong type in the wrong place for the wrong time. This is not new. The house is an imprecise tool for habitation, and its usefulness has always been related to its capacity to change, to be exchanged or to expire. The architect should concern himself with the design of an indeterminate procedure that would allow a house to be available and usable in a variety of forms. The design of the back seat of a motor car is not catalogued by motor car designers as being relevant to the birth-rate. Several homes may be established in one house, whilst a cardboard box may become a house. The house is not a pre-set mechanism for ordering family life, yet numerous architects of distinction have been identified with that single architectural product. But even his undisputed last bastion of the architect's vanity has been taken over by social forces and desires that find it little more than a useful marker in the assessment of wealth. The usefulness of the house, and the way new designs are displayed and explained, have changed yet again; architects have unquestioningly conformed. The last vestiges of control of minimum standards for the size, volume and environmental conditioning of housing have been scrapped without their protesting. It may be that, on realizing this more ephemeral role of the 'house and home', architects will throw in the towel and allow the house to become, at long last, a consumer product equivalent to the motor car. For those of us who remain convinced that the house is worth designing, I append the following check-list.
**Housing**  an assumed continuous societal need?
a constituent of social servicing?
a desirable expensive extra?
an alternative to subsidizing people?
a market-controlled consumer product?
a 'natural' resource of a 'developed' country?
a method of population control?

**Houses**
a national asset shown by population and affluence counts?
an artefactual conglomerate signifying a social grouping?
a series of commodities?
a prerequisite of a static society?
a collection of land-anchored products?

**House**
a 24-hour living toy?
a commonly desired possession?
a container for continuous or intermittent human activity?
an attractive form of public and/or private investment?
an heirloom?
a guarantee of respectability?
a store for personal belongings?

**Home**
a non-locational self-choice collective living condition?
a convenient socio-administrative unit?
a displacement tendency?
a person-to-person multipurpose exchange condition?
a collection of houses, and other useful containers?
a statutory unit?
a privately financed hospital and restaurant for friends?

Against such present-day demands on housing should be laid the not too distant role of the house as a component of the workplace. Cattle barns and granaries, being the source of both wealth and employment, would often accommodate the necessary human workforce (a family) under the same roof. Similarly, the largest, most expensive window providing the best natural lighting would illuminate the weavers' looms on the top floor of the cottage, with the living quarters of the workforce (family) below. The equivalent contemporary domestic 'factory' may possibly be the desk-top-computerized, cordless-telephoned home - but not for long. Just how domestic industrial space will look, and what it will accommodate, is
unimportant to foretell. What is important is that future self-choice individual
industrial activities (they used to be called 'hobbies') will further invalidate what is
now accepted as a house - living room, bedrooms, kitchen, and bathroom. The
Television set and the freezer are more powerful generators of behaviour than the
kitchen clock or sink. Family patterning is determined more by the single parent
and unemployment than the schoolroom or the Church of England. That
extraordinary annual UK event The Ideal Home Exhibition must surely soon require
an Arts Council grant in order to survive. Yet architects still pretend that increased
numbers of the same will solve a need that, due to its very causation, is constantly
looking for alternatives, a need that becomes increasingly fragmented, enabling a
variety of reassembly at different times. Staying with friends at the height of the
season makes good economic sense. The rich have always appreciated the
advantages of staying in hotels, ocean liners, safari caravans, converted windmills
and thatched beach-huts. Politicians and architects ignore at their peril both the
appetite and capacity of humans to exist in conditions which, although deplorable
in themselves, offer the opportunity of variety or change. A mortgage is albatross­
shaped, wherever the house is sited. Few people want to occupy a well-furnished
coffin before its time. George Bernard Shaw once described the modern house as
'somewhere to sleep next to the car'. In a few years this adverse criticism has
turned into an acceptable definition of the desirable future home. However, it is
dependent on the continuous upgrading and restocking of the amenities and
services available to all types of housing and their occupants. Until now, this has
been achieved only by 'invisible' servicing - power, light, water and, for the
fortunate, transport and credit - but even these are fragile. The more physical,
architectonic servicing has yet to be the product of conscious design; at present it
occurs only by chance. Cardboard City is located on the South Bank because of the
waterproof concrete cover and the local availability of free cardboard boxes. These
tragic 'homes', when recognized as such, should not merely embarrass; they
should prompt constructive questioning. 'Is there a possible network of purpose­
designed facilities that could enable the incomplete and unfamiliar to provide the
spontaneity and sophistication that the most urbanely fastidious require of
housing?' The nature of aspirations in housing should always outstrip that which is
on offer. A good building produces the desire for even more from the good client
and, in so doing, eventually renders itself redundant.
National plan

'Non-plan', of which I was co-author with Banham, Barker and Hall in 1970, was concerned with the abolition of a wide range of land and development planning controls. A national plan predicates processes and procedures which, when viewed nationally, can both enable and encourage the relative allocation of design attention and construction activity. It is an extraordinary fact that, during the centuries of Empire, this country was more astute in reorganizing national resources abroad than at home. No doubt this was because self-interest was primarily exercised by the government. It may be desirable to unite a series of product-related activities as a process, the constituents of which will vary over time. For example, energy exchange should unite power transmission, information and data exchange, movement of goods and people, and the networking of natural resources such as water. The single time zone further enables such beneficial social juggling within this small, finite, heavily populated island. Such a national plan would prevent both the public and the Government from viewing school truancy, traffic jams, drought and pollution as 'natural' consequences of an advanced post-industrial society. The co-ordinated view of energy provision which is required nationwide, but in a variety of forms, would enable a reassessment of land-use and settlement - the one not necessarily directly related to the other. An increased use of land for physical communication systems could encourage retaining the location of existing settlements. The co-ordination of energy transfer is likely to increase the range of speeds of such transfer, from the electronic microsecond interval to the several-day country-wide canal journey. The value of continuous transmission can be linked to programmed terminal feed and retrieval on arrival. An increased mix of energy exchanges could increase the number of such activities as 'learning while travelling' or 'browsing and shopping' from home, towards continuous data and activity monitoring on a nationwide scale. Whilst continuous voting may seem appealing, the nationwide ownership of mobile telephones and the resultant method of billing would mean that someone always knew where you were - every citizen would, in effect, be 'tagged'. A re-assessment of which national assets and liabilities are worth measuring would relate to national aspirations, and these in turn are likely to be conditioned by the increasing degree of comparison and feasibility of exchange with similar assets available elsewhere, particularly on the Continent. Nye Bevan once described Britain as an island built on coal, surrounded by a sea filled with fish. The implied self-sufficiency of this description matched the beleaguered condition of the UK immediately after the war. Similar relationships
between dates and the priorities which have been assumed in previous national surveys/plans are indicative of the rapid change of national concerns. The headings of the three serious reports contrast with those of the architect/planner-directed one of 1940.

The Barlow Report 1940
- Changes in population 31-38
- Extractive industries
- The electricity grid
- Trade and transport
- Three periods of unemployment
- Ill-balanced industry
- Women in industry

The Beveridge Report 1942
- The cost of living 37-38
- Hazardous employment
- The old and the young 11-31
- Prevention and treatment of sickness
- TB 37-38
- Doctors 38-39
- Secondary schools

The Scott Report 1942
- Types of farming
- Land of good quality
- Hills and valleys
- Woods and poor farming-land
- Country towns for development
- Overcrowding 35-36
- Village halls

Ground Plan of Britain 1940
- Upland hill and vale
- Climates: Coming of spring
- Seek the sun, shun the fog
- Save the farmland
- Rural solitude and urban sprawl
- Speed the plough and milk the cow
- The mosaic of local authorities
Since the degree of accuracy and extent of data of all four reports is comparable, this difference is important, because it lies in the audience they assume. It is essential that any future political proposals for a National Plan not be 'pasteurized' prior to their being tested on the architectural profession. It is essential that the profession identify the key issues before the politicians do so. Here, then, are a few items that I suggest should concern architects:

- There is no legislation that prevents anyone from receiving any satellite television transmission and there is no sign of an end to the improvement in receiving-equipment. The resultant potential of such twenty-four-hour visual data facilities for a life-long learning opportunity should be equated to that of educational institutions.

- Western Europe in general is draining southward whenever economically able to do so; in the case of the UK, towards mainland Europe for holidays, retirement, education and industry.

- The Channel Tunnel may turn out unexpectedly to have a very differently motivated user, depending on destination. The destination itself may be a zone or an area of particular strangeness, even of deprivation, rather than a particular city or beauty spot. The interurban link is the orthodoxy of the old-fashioned city.

- The periphery is more beneficially socially dangerous than the suburbs, which are merely a reaction to city life and, in middle age, are becoming ill-serviced, finite dumps, in contrast to their former qualities of well-serviced anonymity. A unique asset of the UK, which is only now being re-realized - albeit in a short-term, greedy, piecemeal manner - is that its coastline is enormously long in relation to the area of dry land it encompasses. Although London Airport is the UK's biggest 'port', and the world's largest international airport, its usefulness is as a global stepping-stone rather than as the threshold to Europe. It is the coastline and tides, in conjunction with the spinal relief inland, that should be viewed as heir to the coal and fish inheritance of Bevan. Tidal barriers, reclaimed mud-flats and marinas are short-term toys. The real potential will be found in the realization that one side of this island is lakeside to the Atlantic, and the other is half of the ditch of Western Europe. Add to this the fact that the population of most UK cities has decreased in the last ten years, and you have the most tasty ingredients for a nutritious, imbalanced national pudding requiring a bit of a plan.
Delightful fun

It was well into the detailed design of the project that, at an alcohol-inspired brainstorming session off Times Square in 1962, we decided on the name Fun Palace for our short-life conglomerate of disparate, free-choice, free-time voluntary activities, planned as a public launching-pad rather than a Mecca for East London. Surely, we thought, with such a nonsensical, nauseatingly fey title, we could hide or hang any use on it we wished. Now, less than thirty years later, serious-minded architects are 'designing for fun' - they even have conferences on it. Dangerous coloured-plastic flumes transport children in delight on the sites of derelict steelworks. Power stations are converted into shrines for fake Beefeaters and plastic royalty, whilst the real thing is only half a mile away. Flooded gravel pits swirl screaming kids in inflatable doughnuts down the Staines 'Amazon'. In the depth of one of the nation's last remaining ancient forests, trees are felled, naturewalks pegged out and a Dutch weatherproof glazed dome erected, to ensure a trouble-free Sherwood Forest experience for paying guests. By far the largest site of special scientific interest remaining in the Thames Valley is to be turned into a series of film studios with complementary theme park, replacing nasty mud, creepy-crawlies, nervous wildfowl, and plants scarcely distinguishable from the slime that nourishes them. Some years ago a down-market holiday camp on Blackpool's south shore was replaced by yet another glazed palace, complete with sanitized sand, palm trees, a wave machine, ninety degrees plus of artificial sunshine, and an all-day, family entrance fee. Last year, at the height of the season, it was empty - the weather outside was better. Fun must be a saleable commodity for which there is both a market and, correspondingly, a shortage. The punter's money must be seen to run out before boredom sets in. The free fruit-machine has never caught on, and even free juke-boxes are avoided in pubs - just watch, you'll see. Equally, toys must be seen to wear out - then they can't be accused of having been defectively designed. Toys must remain toys, capable of being mastered and mothered and generally dominated. Lego bricks, the ultimate yawn, are wildly popular. Fun must not be dangerous. No more hand-cut catapults, please, and certainly no home-made fireworks - even the factory-made variety require adult supervision - and community bonfires. Make your own lead soldiers or stink bombs? Why, you can't even buy them nowadays. Rude cushions and itching powder will be next for the chop, together with matches and penknives for under-16s. What has all this to do with architecture? Well, very little actually, and even less to do with delight and pleasure. Designing for delight and pleasure should very seldom be seen to
happen, and must encompass - indeed nurture - doubt, danger, mystery and magic. Why should Mickey Mouse always be bigger than the children he frolics with. Why doesn't Walt Disney Productions have very small people wearing the uniforms, so that children can stomp on their feet for a change? Distortion of time, space and substance is as necessary a design tool for pleasure as it is for religious architecture. To design and plan an occasion at which all comers think they are the first to appreciate it is a fine art. It was achieved by some of the better pop festivals of the sixties, particularly those where conscious design was invisible, but the grass was dirt-free, the trees surprisingly climbable, and the lighting exciting yet not disturbing to the already tired mind. Acid House parties are good, even when they don't happen. Their mystery, risk and operational absurdity are the hallmarks of a magician. I suspect that computer hackers are stay-at-home Acid House fans. Frequently, such a reversal of the expected can generate pleasure and, just as frequently, such a reversal can be taken too far and lose all delight, once the most private of delights, now have festivals, usually sited on land that no selfrespecting sludge farm would occupy. Such 'festivals' encompass yet another quality that is pleasure and delight free - that of fixed time, duration and promise of content. However, clients invariably request such elements in the architecture they commission. How, then, can architects introduce pleasure and delight - and 'old time' fun - into their designs? Primarily with great stealth, is the answer. Footbridges that do not lead to hospitals or support the infirm do not need to seem safe - their designed-in termors can increase the delight of the user who arrives on the other side in one piece. This is no mere fancy; the erstwhile glorious miniature suspension bridge over the three-foot-deep lake in St. James's Park used to shudder as a pair of Guardsmen in mufti crossed it in step, to the delight of passers-by. Wonder is very tricky to design for, since it can usually be experienced only once. There are, of course, exceptions - mine being the water gardens at Chatsworth and the full moon's occasional occupancy of the exact centre of the glassless rose window of ruined Tintern Abbey. Indeed, the aim of the designers of delight is to occasion in the unidentified user or observer of architecture the sensation of being an unsuspecting frontiersman. It is not easy to design thus, but it is worth striving for, since so many architectural products last far too long - far longer than their valid usefulness - and their one remaining function may well be their inherent (designed) capacity to instil wonder and delight. However, if the only wonder they instil is that caused by the observer's realization of their longevity, all is lost. There is, however, always a chance that the delight may be caused
unintentionally, owing to a serious mistake made at the outset, such as a Pisa or a bureaucratic block such as that which occurred with the road/rail bridges on the M1 motorway. We can only hope - but in the meantime it would be nice to speculate that architecture might one day achieve an element of surprise that would be equivalent to chocolate-tasting adhesive on a postage stamp - one per sheet.

**Computers and laziness**

There is not doubt that a lot of computers are incredibly boring. They go on and on, never appearing to tire and diligently producing answers to a degree of accuracy that is beyond nice. The only animate analogy that comes to mind is that of the pit pony, which though blind, was always claimed by its minder to be bright, intelligent and never bored. That account, of course, was second-hand and given by a mere human, and this may give the lie to the stories told about computers. There is little doubt that the development of the computer has been interrupted by human 'operators', like nineteenth-century teachers, wanting to know what is going on during its operation. The demand for interim retrieval, statistical or graphic, requires the machines to retranslate into 'human-speak' or 'human-look'. It would be far better if computers spoke only to each other, and merely instilled in humans that feeling of well-being which results from knowing everything is under control. Continuous monitoring and making resultant adjustments are common enough roles for the computer, and in most professions this is now accepted as a task requiring next to no human intervention. Unfortunately, this is not the case with architects. There was a UK nationwide competition, recently, for architectural computergraphics. Beautifully 'drawn' and 'coloured' buildings or horrific banality won the prizes. Who were the judges? Other computers - or, more likely, envious fellow programmers. At my school of architecture there were competitions - not, thank goodness, compulsory - for cursive and italic handwriting. The content of the writing mattered little; it was the flow of the ink and the stroke of the quill that won the prize. It is tedious to watch a computer ingeniously producing a ceaseless flow of beautiful simulated perspectives of the successive spaces of a yet-to-be-constructed building of staggering dullness. One hopes that real design will not become confused with such tinkering about. Computer-aided design should be involved with body-building, not bespoke tailoring. The trouble may be that most architects have never spent long enough questioning the feasibility of a design, but have always related the stages in the design procedure to the intervals at which others comment, check, applaud or condemn. The inability to relate the amount of
one's own time taken up in programming the computer to the time others spend in retrieving and exploring is similar to the inability of many designers to know when to stop. It is Luddite to insist that computers be 'user friendly'. Few designers nowadays complain that a computer is slow, or praise one for its incredible speed. Similarly, as long as someone is engaged - face-to-face - with a computer, there is little awareness that either, or both, may be rather lazy. Yet it is in the realization of the benefits and pitfalls of creative laziness that lies the benefit of urgency. The ability to 'see' time is as important as that of 'hearing' space (in Dr. Richard Gregory's terms). The radial-fingered clock enables one to visualize twenty minutes as a slice of time that is large enough for a useful conversation or a quiet drink. In contrast, the digital clock requires recall of a digital number not yet displayed, from which present time must be subtracted and the resultant figure translated into a familiar number - familiar through previous experience of its usefulness. No doubt such an exercise can, with repetition, become increasingly easy, even automatic, but I suspect that the loss of the actual two-dimensional imagery of a piece of time is a serious one. The word 'impossible' has something to do with time, whereas 'unthinkable' does not. However, in computer terms both, in a way, are capable of measurement. To speak of the infinite 'patience' of a computer is merely to humanize something we really cannot envisage. The computer's capacity to render useless such phrases of approximation as 'a lot of', 'possibly more than', and 'unlikely to be as large as' also renders extremely vulnerable the mental approximation of visual things. This is where human laziness can rescue the designer who has no wish to flog to death some three-dimensional possibility. Taking infinite pains with a problem is best left to the computer; making a choice is the human's role. However, the development of computers that become 'bored' through not being 'exercised' enough could result in two fields of design activity which are both challenging and intensely useful. Firstly, the bored computer would produce its own possible solutions to a given set of circumstances, whether asked to or not. (This is in fact one of the programs John Frazer designed for our Generator installation in the USA). Second, it is possible that the computer could establish a new language or point-system that would allow the comparison of what was hitherto considered incomparable. The lazy half-science of kinesthetics has always depended on just such comparisons. Designers and architects would be better employed in devising new languages of comparison for computers, than in using them to confirm the obvious. I would like to suggest that the socio-environmental factors that would stop lonely old people from going mad could be utilized in
determining the economic viability of particular intervals of rental vacancy within a newly completed office block - just a suggestion.

**Hold on still**
The ergonomic disciplines related to hand-held or hand-operated objects, as generators of three-dimensional design canons, have to a large extent been made redundant in recent years, owing to an increased dependence on non-manumatic means of activation and control. An example is the automatic, electronically controlled door, activated by a light, sound or heat source. A whole generation of sensitively designed, user-friendly door handles and door pulls is ignored or lost, while contemporary door-users wave around like triffids, in front of visually uninformative doors, hoping to activate something that will open them. Hands have been rendered useless. Electronic cash registers, hygienically hooded, are stroked, whilst garage doors grind open on ultrasonic instruction. The computer clerk looks for your cash or card rather than the price tag on the goods, as the bar code tells all. Lifts don't seem to jerk you up any more and seat adjustments are made as if by magic. A lot of noise has gone out of things, and a lot of digital dexterity too. I'm all for it, since it allows your hands to do other things. But there is a dark side - particularly for designers. Awareness of the weight of things and the amount of applied force required for results is rapidly vanishing. Buckminster Fuller always insisted on knowing the weight of any component he designed or employed. It is interesting how few people can tell you the weight of a bag of food they are about to buy. Trust can be taken too far. In architecture it is essential that designers know the weight of whatever they specify, since, increasingly, their precious creations are the result of numerous different assembly processes and not merely the single process of assembling identical objects - such as bricks. This lack of direct contact with, or awareness of, actual weight can lead to the specification of inappropriate, labour-intensive or, indeed, dangerous assembly processes. Such wastage through ignorance is unlikely to be eliminated by those involved in the increasing variety of lifting techniques and machines. 'Should CAN mean OUGHT?' is a question all architects should ask themselves at all times. Dutch floating cranes could lift the entire Cambridge University History Faculty Library, were it adjacent to water not more than twenty feet deep. However, the design of structures of least weight in relation to buildings rather than aeroplanes has as much to do with their eventual demolition and removal as with their construction. Their intermediate age - that is, when they are of use or re-use - may have more important design constraints, such
as stiffness, weathering of maintenance. While a comparatively new industry, namely off-shore oil, is already discussing and effecting the carefully calculated removal of the massive structures it produces, and an ancient, primitive industry, namely timber, has perfected a method of danger-free felling and delicate removal, the most socially sensitive industry, that of building construction, is staggeringly unconcerned about the hazard, annoyance, cost, environmental damage and general disruption caused by its products' inevitable eventual destruction. Few, if any, architectural schools bother even to suggest that students consider the eventual removal of the man-made dross they are about to design. The ages of a building are five - use, re-use, mis-use, dis-use and ref-use - and its removal should be seen as much as intellectual exercise demanding all types of social and mechanical skills, as is its construction. Weight is not the only physical property that rewards increased architectural attention and application. Size and quality of surface, in relation to touch, and not merely visual recognition, are valuable messengers. Cardsharpers are not the only ones who benefit from the 'shaving' of individual cards in their deck. The message of security or importance that a handrail or shelf edge can speak is often transmitted fastest by touch. When the use of other senses is denied, then such 'hold-on' facilities are even more important. Recently, a driver reached 120 m.p.h. on the sands of North Wales, establishing a world speed record for blind motorists. How should one design a test track for such an event? The 'wobble value' of buildings that gives early warning of an impending earthquake has not been explored fully. Indeed, the production of wobbly buildings could meet many needs, even if only in helping to determine exactly what measurable sensations are required in particular buildings. The Aviary at the London Zoo did not need to be stable and immovable in high winds, since its occupants - birds - are not worried about the change in shape of their enclosure, but only, unfortunately, by its presence. The isolation of the particular responsive environments required in that most unnatural of product, the building, both to justify and to embrace its very causation, is the duty of its designers. Then we can really hold on to more is less.
Southbank London 1983-87

- The last major design project for the Greater London Council.
- The South Bank - an area as large as Covent Garden and Soho combined, contains County Hall, The National Theatre the Royal Festival Hall with other arts buildings.
- With Charing Cross station to the North and Waterloo to the South the area includes the central sweep of the Thames with the Houses of Parliament upstream and the City downstream.
- The proposals are to produce greater public usage, accessibility and delight.
- New horizontal and vertical forms of public movement and observation include a new footbridge and sub-Thames electric railway.
- A variant is the 'Thames Cover' - providing a water accessed giant piazza (more than 20 times the size of Trafalgar Square) bridged with travelators for transverse movement.
- The Thing Tower provides vertical rotating cyclical viewing and static self-choice horizontal observation and refreshment.

The public takes over: areas of assembly and congregation, linked with easy access routes, start to promote a new physical scale - no longer determined by private secrecy, administrative pomp or operational sloth.

The thing
Globe: restaurant globes same size. Globes are top-hung, carry 30 people each and have three horizontal openings.
Solid River: all the bridges are retrained for rapid cross-access up-and downstream, boat stations sheltered by existing bridges
Strate Railway station London 1989

- Three different railway systems meet at two levels within this combined terminal and exchanges.
- Future links are planned.
- The main structure is in tubular steel with cast steel joints.
1. Access to proposed DLR Station
2. NLL passenger access
3. Canopy
4. Tunnel access to high level main lines
5. Disabled lift
6. Tickets-lavatories
7. Retail

Key-axonometric
Casting sketches

Roof truss setting out

Above, below, underneath, on top, over, through & within
Ducklands Hamburg 1989

- 156 hectares of old industrial and dock lands are cleared and cleaned and returned to sand-based tidal river levels.
- The former foundations create the necessary quoins to retain the appropriate planting.
- These crops provide food for the waterfowl known to use neighbouring areas.
- Public access to this 'city' lung is established on variable catwalks penetrating the Speicher Stadt and, where required, terminating, in ferry stops.
- An environmentally friendly amenity is established rapidly and cheaply in the centre of a city while providing further time for long-term planning decisions.

The site under water showing the new frontages so formed

Centrality of site, plotting 20 minutes of movement time
The site centre with the Old City left (3.36 sq km.) The route walkways from St. Nikolai to the retained power station chimney, 1 km (13 minutes walk)
Development of Ducklands with appropriate feed planted for the birds (advice was provided by local nature conservation authority)

The plan related to assumed reactions of its users/occupiers on completion

Key buildings in the Old Town are selected as city end of walkways. Major footings to be retained up to high water mark (spring tide 2.9 m) act as groynes. Area of Ducklands 1.88 sq km including 0.9 sq km of existing waters, cf Regent’s Park and Primrose Hill, 1.9 sq km
Possible future variation of walkways enabling bird and plant protection

Partially submerged in the liquid sands, this alternative self-powered 'floating' walkway is capable of re-alignment, and self-levelling
New Ducklands; the new promenade; listed and improved Speicherstadt; the Old Town

**PFLANZEN - DUCK LAND**

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**TERRAIN:**
- K: SÜMPFE UND MOORE
- L: FEUCHTE WIESEN
- M: WASSER UND UFER

Radial gantries used initially for removing demolition spoil by river for re-use at mouth of the river.
Turlan, Groznjan (former Yugoslavia) 1990

- An environmentally delicate collection of vehicularly inaccessible buildings form the small hill town of Groznjan.
- Concentrated, variable electrical servicing is made available to the homes by means induction - avoiding all disruptive groundworks.
- A generative ariel 'halo' is suspended closely over the entire town.
- The induced electrical power is provided from generators driven by the motors of the three large mobile cranes which erected and now 'permanently' support the 'halo' from their accessible sites downhill.
- When technology improves and these proposals become redundant no physical damages will have been done.

Site plan
Supportive cranes to be used for both assembly and removal of halo
Principles of the plan
Stratton Strassbourg-Kehl 1991

- The first practical international co-operation in urban re-development. The plan includes a new regional Rhine crossing, a TGV station and water related industrial/exhibition activities.
- New labour intensive industries related to hydraulics, land husbandry and horticulture are linked to extended research facilities of the existing universities.
- Learning, information and pleasure networks are integrated with an extended use of the numerous existing waterways.
- New types of housing are spread throughout this new third 'centre' to this unique urban conglomerate.

Transportation systems
Dynamic propinquity. The logic of operational approximation
Alberto Ferlenga, project for Tilburg (The Netherlands) 1988
A lesson in architecture
ALBERTO FERLENGA

The purpose of this lesson is to put together synthetically the main points of this year’s course, focusing attention above all on the need to reconstruct a historical framework of reference and on some aspects of the project. We shall see how that also means busying ourselves with matters that have been forgotten or abandoned, either intentionally or by fate, in those interstitial zones in history and the city. We shall start by looking at particular moments of the history of modern architecture, of particular people who, for reasons differing from one case to another, have been so to speak erased from historical memory, a phenomenon that is part and parcel of our profession.

First of all, it must be said that this does not mean a searching of working as historians or archaeologists of the obscure moments of recent history, but much more simply of looking in history for all the tools we need for today’s job. Naturally, it is indispensable for us to be more or less clear about our reasons for doing the work, at any rate sufficiently so to allow us to identify the paths we must follow among all the complex articulated scenarios of the sadly missing from the official histories, paths traced by schools or working groups, but also frequently by individual lives.

We can first of all state that this interest for the matter of history is certainly connected with what is at the centre of our planning activity, that is to say the type of relationship with the city in which we frame our analyses and transformation proposals. This leads us to a preliminary narrowing down of the problems to be faced, but it is surely not enough, especially if we consider the by now generalized statements of contextualism, grouping together, or at least claiming to do so, such different projects produced by ‘architectonic families’ that sometimes nowadays assume opposite, but equally generic and hazy ideas on ‘deconstruction’.
Some step forward to being more precise can be taken by continuing to believe that very hypothesis of urban transformation must pass through a perfecting of tools for understanding the city and through the study of a tradition which that perpetuated and renovated age-old urban spaces. In this case, too, especially in Italy, we merely belong to a school that since the '60s has been producing the important books, analyses, and projects we all know, and as well the mentality needed for interpreting new urban phenomena.

Now that the illusions of a way based exclusively on typological extensions, or sociological connections has been lost, we are again today, when tackling the problem of cities, in the position of having to reconstruct a tradition, and this is a frequently recurring condition in architecture when the rules and images of the reference field are profoundly changed.

But let's take this further. Due to the conditions of the cities themselves, the type of relationship with the city we have alluded to and that we are trying to put into practise, requires us to make comparisons with analogous moments in history, which we could generically define as moments of crisis, when the urban framework has needed an updating of its image on account of a slow or sudden evolution in its very nature. In moments like this, the answers of architects or urban planners have been extremely varied, even in the course of this century alone.

Probably what we most tend to remember are the utopias of modernization that have accompanied the rationalist movement, those vertical or linear cities with their cold drawings in the pages of the histories on which our training has been based, which seemed to represent the only possible hypothesis for future urban planning. These drawings, so devoid of utopistic fascination, are the ones we have later learnt to recognize even amidst the misery of the suburbs, and have been emerging in the network of council house quarters with their separation of streets and buildings and the cold white of a facade. They have been used and deformed by those who, in their newly gained freedom, saw in them merely a way to cut themselves off for ever and with greater profit form the trend of a long urban tradition. But other answers were given in the same years to the recurrent collapse of the cities: these were not just the patching-up work of academics or the blocked forms that became the butt of the avant garde's insults, but rather a sort of via media that we are only today beginning to realize by the way it is emerging in
fragments, even if contradictory ones, rather than in completed works. This is a path that affords us a view of certain protagonists, but, and perhaps more clearly, of works often arising from personal and artistic initiatives that then take other directions.

Thus, if it is fair to say that form the studios of some of the great figures of modern architecture, pioneers like Wagner, Behrens, Berlage, or Perret, decidedly different ways of more or less directly viewing the concept of 'modern', were soon being followed which, from the same origins led in totally different directions, the matter becomes far more difficult when one then looks at the long-term consequences or extremely contradictory experiences of this. And so it is simpler to refer to certain works whose formal language is different, but, which seem to be saying things in common, while being remote from the disconcerting uniformity of much of the modern movement, and meaning that nations and personalities can no longer be distinguished. Certainly, the list at this point could be a very long one including buildings and projects. It is enough to say here that an initial factor of surely the free reference to historical forms which are subjected to an updating by way of simplification, deformation, and local reduction. These forms are confronted with the new materials, new techniques, and new requirements and aim to search out the current potentialities and develop their 'modernity' in projects often hovering between extraneousness and imitation.

The project therefore becomes a subject of mediation where the known forms look for new opportunities of combination in compositions still strongly marked by separations of volumes and parts. Thus, for example, if the reference to classical language is a frequent one, it never appears in the straight jacket of fine-arts teaching and is rarely accompanied by clumsy typological reproposals, but tends rather to appear inside a general process of decompositions which breaks very obvious figurative compactness. In this closed and free dialectic between a rigorous reference to history, the modern separation of parts, and the frequent use of analogy, there is an extremely important indication for our work. However, what makes it all the more interesting is how it gives rise to new processes involving the city, tracing the lines of new forms of urban control. We were speaking of the need to making comparisons with moments when situations of urban crisis are interwoven with some of the events to which we were alluding. The cases are many: whether the needs of a new look for Stockholm, or the postwar
reconstruction of Marseilles or Le Havre, or the post-earthquake rebuilding of Ljubljana, or quite simply the use of architecture in an attempt to create order, recognizable features, and quality even in the most disrupted of urban areas such as the outskirts of Algiers appeared at the time of Fernand Pouillon’s works.

Perhaps it is useless to attempt to look for common attitudes other than the general observations we have already made, but certainly in the nature of some of the buildings produced by these experiences there are other common features that should be remembered. Among the most evident of these is a certain type of ‘complexity’ of the buildings in question, and here we are not referring just to the category of ‘composite and ambiguous’ buildings which Colin Rowe speaks of in Collage City, but rather to a sort of contrived cocktail of buildings and city where the usual elements connected to the architectonic function are assembled in one and the same organism around others in which the urban character prevails.

The great covered square of the Oestberg Town Hall in Stockholm, the courtyard-streets of the project of the Royal Chancellery of Asplund, also in Stockholm, the colonnaded square of the Climat de France by Pouillon in Algiers, or the intrusions of minute or grandiose urban fragments in Plecnik’s buildings do not become just the central theme uniting the various construction parts, but are above all moments of interchange between architecture and city in which, with the appearance of openings, separations, and breaks, possibilities of urban reorganization are also seen in a new light.

Among the buildings and urban areas in question, a reciprocal process of attraction is generated that goes far beyond the immediate solution of the specific problem which gave rise to the project, and that involves vast parts of the city and more generally its overall image. The forms in which this process are manifest are many, and often the end result tends to generate large pieces. But whether it is a question of buildings or of more complex organism, in which the broken outlines, a certain apparent incompleteness, the restrained separation of the elements, or their shifting from the usual positions, all become the conditions enabling an easy connection with the context.

In some of these projects, one seems to perceive a calibrated use of urban memories interwoven and measured in a scenario of ‘separations’ belonging to
more modern forms of contact and contextualisation opposed to the old or modern insertion of rigid and blocked forms, all this also tends to constitute strong elements of urban attraction.

It is as if, considering certain works and projects, one were to see united the nature of ruins and of the monuments, together with a superposition of the meanings of synthesis and of opening which are present in both; as if the crisis of the city were to enter into the new projects and were ennobled in them, being compared with a great tradition, together with an architectonic quality able to reinterpret by analogy even the most banal pieces, and thereby give back to the city spaces which are at the same time recognizable and new as key places in a process of renewal.

At this point, in order to probe more deeply into the questions connected with our course, one should make a more extensive study of the nature and role of certain spaces in the contemporary city. The scene shifts from forgotten moments in the history of architecture of ‘forgotten’ areas of the cities. We shall try to verify whether what has so far been said may be enough to constitute a process of reconstruction for a new tradition, the use of which for making projects is all the more useful if applied to particular areas where common signs are recurrently observed. We shall depart from an assumption and limiting of the theme to a specific category taken as an example.

The assumption is the following: the spaces that the city forgets in the course of its evolution have formed in certain periods the poles of a process of urban redefinition that has profoundly changed its own original context.

It is not the case to recall here the very varied reasons or restrictions which in the course of history have led to vast urban areas being preserved, nor the well-known instances such as the knocking down of a wall or so on, which have made other areas available. What interests me instead is, by freely analyzing examples very different from each other, to test a hypothesis. Whether it is possible or justified to attribute any particular importance in a modern process of renovation of the city to all those interstitial areas of differing nature inside which the urban image appears to be weakened. One would have to make great distinctions, but I should like to exclude at once the vast spaces becoming available due to the results of some of a previous function. It is not so much the affirmation of a new city in the place of the
old one that I find it interesting to analyze, with reference for example to the results of some of the big competitions that have recently been held regarding areas of this kind. I am referring, instead, to a work having emphasizing and correctional characteristics rather than those of a radical transformation.

It is a matter, therefore, of taking into account for example the relationship that the city develops with some of its own infrastructures, and two aspects in particular. On one hand a kind of projectual abstention that puts into an architectural limbo a considerable number of pieces of the urban network, such as streets, embankments, buttresses, places where special functions have produced buildings half-way between technology and geography, and on the other hand the forces often emanated by such places which are among the most evident features in the history of a city.

The examples could be innumerable and be drawn from personal modes of observing and remembering a place. I shall mention only two: the great arcades in stone surrounding the port of Algiers and the canal running through the centre of Utrecht in Holland. As one can see, these examples are very far from each other but, in my opinion, they have in common the capacity of creating a strong harmonious image which overlies the extreme complexity of the original situations.

In Algiers, the succession of embossed arches seems to hold together a city which is broken up and disarticulate like few others. Its power of attraction does not just affect the colonial centre which is nearest to it, but involves in the distance the whole urban network. In this places, which seems a kind of arched bastion between the quays of the port and the palaces put up by the French, numerous suggestions fit together, not least of which is the reminder of the great works of the Roman infrastructural system that still vitalize the Algerian countryside, or that of the Adam brothers along the Thames. In its arches and meanders one finds again a situation reminiscent of the proliferation of humans who once inhabited, and still do, some great ruins. There are shops, markets, houses and stores, and the contrast between the impressive uniformity of the arches and the extreme variety of what surrounds them is the thrill of anticipation for those who approach from the sea, and the most vivid memory of those who leave the city.
In Utrecht, the main canal running through the city centre assumes a particular aspect due to the presence of a kind of second embankment, linked functionally to the commercial use of the canal and forming a sort of pathway between the city street and the edge of the water. It appears to lie in the canal bed and gives access to the warehouse doors, behind which goods are stored beneath the level of the street above. The presence of this mediating element between the water and the city, and above all the subsequent transformation which has made some parts of it into a place for relaxation and strolling, contribute in an extraordinary way to giving the city its particular harmonious character.

In Algiers as in Utrecht, the urban network surrounding these places has undergone various radical changes up to the most recent and dramatic ones of 'modernization' that have led the cities to the brink of losing their identity. The structures of the port and canal are by now almost totally devoid of their original meaning, although their character of harmonious organism remains, the only ones that the city allows to retain such a function, a repeated form that still holds uncontrollable fragments together.

The two distinct parts of what we have so far said, that of history and that of the places, can be found to come together in the person of a certain architect and in his work in a city. I am referring to Joze Plecnik, who certainly was aware of the nature of these places when between 1920 and 1940 in Ljubljana he made a drawing of the Ljubljanica and its affluent. What it is interesting to dwell on in that well-known story is the architect's ability to convert an essentially technical job of lesser importance into a great urban planning occasion, so as to raise up again a city still suffering from the effects of the 1895 earthquake. As is well known, Plecnik's idea was to change the course of the river into an architectonic axis, an effective spinal cord on which he grafted a series of public spaces obtained by reinterpreting bridges or banks and some of the buildings. As he could not completely control the city, he chose to work on one of the nervous systems, reinventing the most common elements and creating an urban meaning of such power as to involve the surrounding parts. This method in Ljubljana was experimented several times and, even if on a lesser scale and with greater discontinuity, other examples can be seen in the working out of the castle approach as well as in those of Vegova Street, or in the arrangement of the Roman walls area. In fact, it is the last of these works that leads us on to a further consideration: the enhanced meaning that elements of
extreme dimensional and formal simplicity acquire, and that leads them to assume an urban role quite out of proportion to their objective importance, is to a large extent due to a mixture of historical evocation, infrastructural simplicity, and museum-like setting. Plecnik sets his most slender pieces in the city as if he were reviving the traces of the ancient axes. the promenades, the little parks, the areas for sitting, and the little squares frequently indicate the place of something from past urban history, that becomes the pretext for a projectual process in which other motives are then included. On the one hand, therefore, the city is treated as a museum of itself, and on the other its very history becomes in a concrete way as well as in the little things, a reason for transformation, even if the new objects will have the simplicity of those walls and buttresses that have linked, equally over all the centuries, the various parts of the city to topographical emergencies.

At the end of this talk and as a final conclusion, I would like to propose two images derived from projects made some years ago. They are two sections that synthesize in their reference to the city and to history, and in their proposed use, a part of the questions which have so far been mentioned. The projects were those for an important square in Vicenza (the one where there are Palazzo Chiericati and the Teatro Olimpico) and a final stretch of the Florence embankment. What they have in common is the idea that a part of the bank of the watercourses in the two areas, appropriately treated in architectonic terms, could become the basic element for a process of requalification of that area, thereby resolving at the same time technically important problems such as that of the parking places, accessibility to the area, etc. Thus, the tongue of land at Vicenza between the Retrone and the Bacchiglione and a stretch of the Arno embankment at Florence were transformed into a viaduct and into basement for the other parts of the works and for the surrounding city. Still, in both projects, the idea of the street or a roadway clearly defined in architectonic terms meant the researching for a particular relationship with the constants of urban history and a reconsidering of 'technical' or service parts in the work of reconstructing a vault as well as a quest for formal credibility and a tradition for the contemporary city.
The portico approach

The orange tree 'Rambla' leading to the parking area

The little square
The entrance to the Alhambra, Granada

ALBERTO FERLENGA

Essentially this project does not differ greatly from the earlier proposal presented. Each of the pieces it is formed of, has been subjected to tests which have shown its architectonic and dimensional characteristics to be right, have made some of the details more convincing, and have found the correct role between the shapes of the land and the lines of the building. Its set of large, partly autonomous fragments has thus been enhanced, but the overall plan has also acquired a fresh balance which is the result of combining topographical and historical elements.

Apart from revealing the excesses and imprecisions of the earlier plan, this perfecting of the project has also shown the possibilities of the various pieces and the relationships that each could have in its immediate context, with given functions or with the Alhambra in the distance. The terraces, the steps, and the buildings have little by little created a concrete image, making closer contact with the territory and proposing a new geography. The references to places or events that over the centuries have been so extraordinarily synthesized at Granada have been summed up and interwoven.

Finally, the whole project seems to be a work of recognizing and accentuating places, and of tending to identify above all an essential picture onto which all necessary future additions may be grafted. The very nature of this departmentalized picture means that each component part is flexible and easily varied without the overall image having to suffer. Such is the case with the avenues, the bastions and gardens, which are the main architectonic features of this plan, conceived in a way that the autonomy of each part forms the essential condition for any interventions. Those cannot contrapose a 'total' project in front of the great monument, but merely a set of fragments leading the visitor, variously and with strong archaeological connotations, up to the Alhambra and the Generalife. From the parking area to the 'Rambla' of the orange trees, to the
porticoes, the whole way is still one large fragment, bordered by terraces and palm
trees, whose main raison d'être is the monument to which it leads. In the
accompanying notes to the earlier project, we made an analogy with the road
cutting the Arabic part of the city of Mogador; however, this revised project leads
us rather to another place in Marocco, the Roman road at Volubilis running through
the landscape between the ruins and pointing at the walls of Meknés slightly in the
distance. As has already been said, the description of the project piece by piece is
not just a matter of convenience, but reflects its essential character. It must follow
the approach road to the monument.

The parking area
The requirements connected with the parking of a large number of cars and buses
have strongly conditioned the project and led to a reduction of the initial
hypothesis. The choice has generally been for an arrangement of the parking area
such that complex and expensive works are not the main feature, but where above
all the possibilities afforded by the varied ground are exploited. Certainly, the
parking to so large a number of vehicles (about 400 cars and 40-50 buses) can only
have a negative impact; therefore the problem of parking must be tackled together
with those of concealing the vehicles and of costs.

The areas chosen, which were those prescribed by the competition and by logic,
are at the eastern end of the park proposed in this project, the one farthest from the
walls. The area of the olive grove between the cemetery and the start of the park,
that of the first part of the slope going down, and the area near the southeast end
of the museum are involved. The parking areas are thus divided over three sectors,
of which the first two are mainly for cars an the third for buses, even though it is
clear that, whenever necessary, these roles may be inverted.

The project for all three areas is defined by an element of fill constituting a sort of
archeological section and continuing the project up towards the mountains while at
the same time giving rise to a set of small mounds of green to hide the vehicles.
Quite simply, it is the integration of these mounds into the slight hollows and with
an appropriate planting of trees that will guarantee not only the necessary shade
but also a visual barrier between of the parking areas and the other sectors of the
project. The bus park is additionally hidden from sight by the series of terraces that
will go down in steps to the museum.
The parking areas will be complete with toilets and places for refreshment, seats, and sales stalls. From here the visitors can walk down to the Alhambra along the approaches described below, while the electric shuttle-bus service will offer a more comfortable and quicker means running down the central lanes at either side of the orange tree 'Rambla'. The surface of the whole area will be in tamped earth. The whole central part starting from the parking areas is to be seen as a vast park for pedestrians made up of different elements.

**The museum bastion**

This is the first of the parallel avenues going down towards the Alhambra and forming the skeleton of the access park. It is a series of terraces following the slope of the ground and with evident reference to parts of the Alhambra. The bastion begins with a small building containing some of the service areas for the parking and the first of the restaurant and sales stalls areas. From here a path goes down through the garden terraces between two rows of palm trees. Some porticoes at the side house the necessary sitting areas and indicate the main approach ways to the museum. The purpose of this part is to delimit and conceal a difficult area, and it has therefore been planned to make one area with the museum. Without difficulty, the porticoes or terraces creating an outdoor museum walk. The end of this avenue of palms and walls is formed by a wide and slow series of steps going down to the ticket office square. The side of the bastion, like a simple restraining wall is cut by the steps along the approach. It could be face in brick or stone to recall analogous elements to be found in the surroundings. The front is decorated with a series of arches, some of them blind and others open, which, where their height allows, could be used as places for seats or for sales stalls.

**The hotel bastion**

A similar delimitation, parallel to the previous one, runs around the hotel area and forms the edge of the large Aljares olive grove. It is different in nature, less architectonic and tending rather to mark the limit of a linear garden with variable sections similar to some places still existing among the Arab houses of the Albaicin. The start of this garden walk is from a building similar in size to the contiguous one we have already described and with which it forms a sort of lodge or gate to the park. This building is a hostel whose gardens are both the completion and a more general enlarging of the hotel area. Like a lifter, this bastion also forms the beginning of the 'side' walks leading to the Cerro del Aire among the olive
trees. The main quality of this area is precisely its closer relationship with the landscape. It also contains the road leading to the cemetery between brick or stone walls cut by the steps going to the olive grove or down towards the gardens.

The orange tree 'Rambla'
Between the two bastions a large pedestrian avenue separates the lanes for the shuttle bus and gently follows the slope. This space with trees is either in tamped earth or paved, like so many that are to be found in the cities of Spain of North Africa. The rows of orange trees with their canopies touching form a shaded tunnel like the one in Tunis going towards the lagoon. Among the trees there are permanent kiosks or movable structures for sales stalls, as well as benches, platforms, and fountains; everything in short that will make walking and sitting down pleasant and easy.

The little square
Beyond the steps at the end of the museum bastion, a little square following the actual outlines of the ground offers a space for walking or sitting down beside the ticket offices. In the centre there is an Arab-type pool framed by palm trees, while all around short 'cryptoporticoes' are inserted in the slope; these are formed of an atrium open towards the square and an internal gallery lit by skylights where postcards and souvenirs may be bought. A cordon of bricks or stones connects these elements to each other and forms a continuous shaded bench for visitors. At the entrance to this little square there will be the bus stop for the shuttle service connecting the entrance to the parking areas. On one side there will be some of the buildings forming the entrance: the bar and the ticket office kiosk. This space will be paved in chequered squares of stone and small pebbles.

The portico approach
The actual entrance to the monumental area is formed by a short portico approach avenue following the line of the cypress trees leading to the towers and the Generalife. Its composition in various elements is reminiscent of the Arab houses in Andalusia or Africa. Thus, it is a little white suburb arising at the foot of the walls and making a new gateway. Under these porticoes, various material in the form of photographs or models can introduce the visitor to the history of the Alhambra. The porticoes also constitute the trait d'union of the little buildings housing the necessary services: the ticket offices in the first tower on the right-hand side, and
then the parallel buildings of the bar and restaurant and toilets; on the left-hand side are the exchange offices, telephones and post office; parallel and connected to the porticoes is the first-aid post facing the city. Other premises can be obtained by restoring the already existent offices, which will also be connected to the porticoes.

**The olive grove walk**

It is proposed to complete the vast Alijares olive groves. This is bounded on the side of the park by a retaining wall separating it from the cemetery road. Here there are the steps leading to the various avenues that cross the area before converging towards the walk that follows the crest towards the Cerro del Aire. This is an 'architectonic' path, in conformity with the curves of the ground between two low walls, where the olive trees finish and from which a series of terraces emerge overlooking the city. From here the steps begin going down the slope to the grottoes. The walk and terraces that in the plan are reminiscent of a portion of wall, have no real beginning or end; they are planned rather as a restraining line or border to the whole project. Seats, small fountains and pedestals for sculpture can be arranged on the terraces, whereby the walk will become an outdoor exhibition area and not just a simple avenue beside the olive grove.

**The belvedere**

At the top of the Cerro del Aire another small hostel will be built overlooking the Alhambra and Granada. Its architecture recalls that of the villas dotted over the zone and, like the access road to the monumental area, is composed of small buildings grouped together, this time around an open court with trees facing the plain. The restaurant in the central building opens on to a wide belvedere terrace, while in the long wings at the sides of the court there are bedrooms with bathrooms. The project finishes here, which is why this place has been called the end of a road. The road from the new access park to the Alhambra arrives in the orange-tree courtyard, while at the sides of the central building can be seen the avenues, monuments and walls among the trees. In addition, from outside the buildings, on the terrace in the night sky, the city lights, the Alhambra and this project for Granada will all be there open to view.
1. The parking area
2. The museum bastion
3. The hotel bastion
4. The orange tree 'Rambla'
5. The little square
6. The portico approach
7. The olive grove walk
8. The belvedere
The orange tree 'Rambla' leading to the parking area
Detail of the project: the little square and the portico approach
Detail of the project: the parking area, the museum bastion, the hotel bastion and the orange tree 'Rambla'
Detail of the project: the olive grove walk
View from the central area

View from the Grand Canal
The purpose of this project is to propose a solution whereby the Piazzale Roma area no longer has merely the function of a motor vehicle terminal. We have therefore tried to answer faithfully the conditions imposed by the competition, but at the same time to consider the possibilities of a future transformation of this place which leads into the city.

The square is thus defined as a sort of port with fixed boundaries which gradually assumes the nature of a fragment of urban fabric on the Grand Canal, with steps, quaysides, bridges, etc. The centre of Piazzale Roma is like some vast container that receives and sorts out the mass of motor vehicles, but that could also be imagined as a large pedestrian area, or as a garden or park if one day it is decided to push the arriving vehicles back towards the mainland. The entrance to Venice also in its symbolic meaning is constantly punctuated by the buildings forming the project, just as the pedestrian bridge with its three large pylons effectively constitutes a gateway or lock, while other passageways and secondary gates open towards the canals. The reason for the choice not to make a single compact building on the Grand Canal, but to decompose the parts, is that of proposing place crossed by the mass of visitors and giving an advance idea of the spaces, images and materials of the city's urban fabric, of which it intends at all costs to be a part. The blocks composing the building house the main functions required by the competition and also form a backdrop for the whole square, and yet another gateway through which the city and its canal are seen and framed between openings and flights of steps.

The nature of this piece, both a building and part of the urban scheme, is at the same time to correlate the style with that of the various Venetian buildings the visitors will meet in the city and with a certain theatrical quality so inseparable from Venice. The main building is the one to summarize the project and to be its central element. Its articulated shapes, the succession of courtyards and covered passageways, the wide steps looking on to the first of the city buildings like the tiers of an ancient theatre where the scene is fixed, the ramps and narrow streets leading down to be enlarged, the compromised volumetric relationships to be
recovered, and what by means to the spelling out of the volumes brings order and a sense of attraction to the whole square going beyond a purpose of specific function.

In short, the project tend to bring out roots rather than superpose elements. Such, in fact, is the case of the main building, the little docks on the Rio di Sant’Andrea, the steps framing the space, the stone portals, even the pylons of the overhead bridge, independent fragments combining to define one common image, that of a square or a port whose outlines or flagpoles emerge, from the confusion and gatherings of people, without any formal forcing, but with simplicity pointing out directions and routes towards a Venice that at times is still the same as it seemed to Hofmannsthal's Andreas, pale, deserted and without shadows admits the morning mists. The nature of the project requires it to be described piece by piece.

**The pedestrian bridge**

This is a bridge containing staircases, escalators and elevators for leading the flow of pedestrian towards the Santa Chiara quay and the motorboat departures. It is also the end of a road flanking the garage building and therefore collecting people who come out of the garages or arrive from the more distant outdoor parking places. At the same time the bridge is the generating element for the building on the Grand Canal. Access to the internal area of the square and to the city is had by walking along a fenestrated corridor supported on three stone-faced pylons.

**The building on the Grand Canal**

We have already spoken of the composite nature of this building, consisting of many parts. Immediately next to the end part of the bridge there is a building with a courtyard housing the airport terminal offices. The open space of the courtyard could be covered thereby gaining more space for making a large hall or roofed square. At this point the building continues in various blocks opening out in terraces and steps towards the Grand Canal and keeping a more compact front towards the square. The central block is shorter than the others and houses a bar on the groundfloor that extends to a terrace giving on to the canal, with the ACTV offices on the upper floor. The other two blocks contain the offices of the city police, and those of the Carabiniers and the first-aid post, respectively. The courtyard and first two blocks of the building are connected to the upper floor. Porticoes towards the square and pilastrode passageways leading directly to the
Santa Chiara quay are the structures allowing visitors to pass freely through the building. Obviously, the courtyard, the open spaces of the groundfloor, the porticoes, steps and terraces all facilitate flexibility in use of the groundfloor of this building, whose composite theatrical nature can be exploited by setting up in the space it offers some of the minor commercial activities that today are dotted over the square. In the part overlooking the parking places, the buildings rests on a basement of a few steps which raise it above the level of the internal area and identify it the more clearly as one of the gates of access to Venice.

**Covered terraces and passageways on the Rio Nuovo side**

The present-day garden area is bordered on the side towards the square by a sort of little treed bastion cut by doorways and covered passageways leading to the Rio Nuovo. The bastion is the boundary of the square and extends the existent garden area, while the doorways and covered passageways are seen as if they were moles where the visitors alighting from buses are collected in appropriate areas for the short-term waiting foreseen here. The project also envisages a platform on which stalls and other movable structures can be placed in a more orderly fashion. For the present-day garden area, rearrangement of the fountain basins is foreseen which will not compromise the existent trees and will receive the lawn.

**Left luggage area**

In the area prescribed by the terms of the competition there will be the building for left luggage and other services. For this, a partial lengthening of the Rio Terra Sant' Andrea is planned so as to create small bays making the handing in and out of bags the more easy. This group of buildings completing the project of the square is to be considered a set of little docks.

**The central area**

The place for 40 buses required under the terms of the competition will be here. In reality, as has been said, this area can be utilized in various ways. We have indicated the position of the arrival bays where the necessary shelters will be erected. The central lane between the areas for halting is broken by high flagpoles mounted on stone basements, which in some cases will serve as resting places for drivers. On the side of the square towards the garages there will be the area and shelters for the taxi rank, while behind the big garage there will be the treed approach to the bridge for pedestrians.
**Campo Sant' Adrea**

In the long narrow passageway between the two garages there is a lane for pedestrians but also halting space for public vehicles. The latter can be moved so that the lane will reacquire the character of a Venetian street leading up to the square in front of the church of Sant’Andrea, where among the trees two flagpoles mark the beginning of the approach to the city.

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**Project site plan**

1. The pedestrian bridge
2. The building on the Grand Canal
3. Covered terraces and passageways on the Rio Nuovo side
4. Left luggage area
5. The central area
6. Campo Sant’Andrea
J.J.P. Oud, Blijdorp housing, Rotterdam 1931/32, project
Dutch architecture today

CAREL WEEBER

Design research at colleges of architecture in the Netherlands is currently in a state of malaise. Many architects are unsure and support the view that designing is a purely personal matter. For them, norms - both functional and formal - are anathema. Architecture as a discipline has apparently ceased to exist. It seems very necessary to breathe new life into architecture. A first condition for this is to once again develop design research, which in the course of the years, despite the flourishing architectural culture which we see all around us, has practically disappeared from the universities.

The 1960s and 70s

On 3 March 1961, the architect W. van Tijen introduced a discussion evening for architects in Amsterdam, giving his view of the magazine *Forum*: 'Endless rhetorical and vague stories, enormous over-estimation of their own work, over-advertising of this both at home and abroad, the monopoly of architecture and town planning based on their own limited ideas as typical of partiality and immaturity, confusing for the younger generation, damaging to the deepening of architecture which is so necessary. The current *Forum* is certainly not conducive to resisting these tendencies.' Van Tijen accused *Forum* above all of lack of clarity and confusing things which are essentially different: 'The architect is not responsible for society. He is only responsible for architecture, partly for the building and completely for his own work. If you do not keep these things apart, architecture cannot be advanced.'

I believe that Van Tijen was here touching precisely on the essence of the development which architecture in the Netherlands would later undergo. Exactly as he predicted, the disciplines of architecture and town planning have indeed reached a dead end.
In his introduction Van Tijen fulminated against the views published in *Forum*, a magazine which was enjoying its heyday at that time. Characteristic of the *Forum* group was a view of architecture which proceeded from the principle that 'the human condition' and 'building' were indissolubly intertwined. Not only was architecture understood as an expression of the human condition, but also as something which influenced the quality of human existence in the moral sense too. It thus became common to speak of 'human' versus 'inhuman' architecture, with implicitly only positive capabilities and characteristics being ascribed to the human.

According to these ideas, the summit of bad architecture was by definition architecture which was produced under fascist regimes. Good architecture was supposed to contribute to democratic developments and in general to better human relationships. With this intricate tangle which architecture and town planning had ended up in - and against which Van Tijen was protesting - we entered the 1960s.

When around 1968 the wave of democratization hit the Architecture Faculty of the TU Delft, the question arose of, the social relevance of architecture. The effect was to temporarily halt (unjustifiably) the production of designs in education. Another effect was that the progressive movement started to orient itself to the social context of building (rightly so, for that matter). As the direct linking of architecture and society - a heritage of the *Forum* ideology - continued to prevail, the solution for problems which arose were sought mainly in the social sciences. Since then, much has come to the surface, but at the same time the discipline of architecture was neglected, because attempts to develop this via other disciplines failed.

The wave of democratization led to feelings of guilt and insecurity among architects in the practice of building. Henceforth, here too designs would be accompanied and explained by the jargon of the social sciences. People thought they could represent concepts such as habitability, identification, perception, encounter, recognizability, needs, orientation, participation, in design. After some time this led to a new style, also due to the activities of the *Stichting Nieuwe Woonvormen* (in retrospect, a better name would have been New Roof Forms): The Small-scale, also called the *Nieuwe Truttigheid*, or New Drabness.
In contrast to the situation before 1970, since then there have been forms with a strong emphasis on the individualistic and the petit bourgeois, with the size of the dwelling as both largest and smallest unit of size. The block and its size disappeared from the picture. This train of events was also stimulated by the growing aversion to highrise, the design practice in urban renewal areas after the anti-demolition campaigns, the rise of resident participation, the small-scale movement after the first energy crisis and the end of the ideology of progress.

The 1980s and the present

It is possible to argue that with the onset of the 1980s, a golden era dawned for architecture in the Netherlands. State and business sector have taken diverse initiatives in which architecture occupies a central position. The Ministry of Culture has initiated a powerful architectural policy. Large budgets are made available to enable recent graduates to set themselves up as independent architects and also to support cultural activities in architecture. The Netherlands is coming under the spell of Architecture with a capital A. Not only the professionals themselves and the interested public, but also politicians are showing great interest in architecture happenings. It has resulted in innovations in the system of briefs: public selection of architects, competitions, and multiple commissions have taken the place of the usual relationships between architect and client. A large-scale cultural business is flourishing with a cornucopia of architectural prizes, gatherings, discussions and symposia, exhibitions, manifestations and publications, which are carefully followed and commented upon by a large number of architectural magazines. Publications succeed each other in a steadily rising tempo and nowadays every self-respecting architect is on the lookout for a publisher to bring out his monograph, cut-out or dissertation.

You could argue equally well that in the 1980s, architecture in the Netherlands was in a deep crisis. Under pressure from the policy of cutbacks and weaning from the state, the lively climate which had developed in the 1970s as a consequence of democratization and the involvement of architects in social processes turned into formalism, not only in architecture but also in institutions for architectural training. The Ministry of Culture parries the criticism of the malaise by stimulating and extolling an artistic approach to the profession. The production of beautiful illustrations became a condition for support and recognition. Universities do nothing. Under the pressure of cutbacks the positions won in the 1970s are
defended and research at this faculty focusses on the so-called objective-oriented
design research, programmes of requirements, technical research, research into the
possible recycling of the building stock, research in the field of building
management and technical management and research in the field of public housing
and urban renewal.

It was chiefly architectural critics who at the same time introduced into the
Netherlands the international discussion around postmodernism, and tried to
proclaim a postmodern movement with the work of 'young architects'. Nowhere in
the world has the phenomenon of the 'young architect' taken off as it has done in
the Netherlands. This is a group of young colleagues who have to stress their own
distinctive features as opposed to those of the others, in order to establish
themselves in the market at a time of economic recession and privatisation. This
group lacks a common name, a certain degree of shared direction in terms of goals,
procedures and products. There is no grouping around a programme. Architecture
is reduced to a mere artistic game. In this respect a clear break can be noted with a
tradition of modern architecture, which shows a succession of clearly
distinguishable groups who unite around a common programme. Because there is
no group formation, some critics have a tendency to describe the architecture of
the 1980s in terms of individual masters. This suggests that there has been a
regression to the romantic ideology of the architect as inspired artist, and that
rational analysis is not possible.

Do not misunderstand me: although the Faculty of Architecture of the TU Delft to
which I am attached, just like other institutions in the Netherlands concerned with
architecture, is a bulwark of modernism, I do see postmodernism as an important
progressive movement, in terms of both architectural theory and social criticism. I
am not looking for a restoration of the homogeneous project of the modern
because I think that the heterogeneous character of postmodernism can certainly
offer an adequate response to the problems confronting architecture under the
current pluralist cultural conditions. But I do have to note that the formulation of
research programmes with sufficient base of support in a pluralistic field is not as
simple as in the heydays of functionalism and rationalism.

By functionalism I mean, among other things, the work of Dutch architects who in
the footsteps of the international avant garde of the 1920s, came together in _de 8 en_
De 8 (Amsterdam) and Opbouw (Rotterdam) were associations of modern architects, also the Dutch CIAM Group.

Opbouw:* They emphasised an analytical and rational approach to building and believed in the possibilities of a democratic, generally valid, and verifiable artistic production, which is based on systematic research into the characteristics and laws of architectural forms. According to them, to an important extent the form of buildings can be derived from functional and technological considerations. A building is modern when it no longer makes any iconographic references, but embodies the programme of requirements or expresses directly a socio-cultural objective. For modern architects, belief in science and the controllability of forms is still intact. In their eyes, technological progress seems by definition to imply a progressive development. With the quest for a verifiable and predictable cycle of production and consumption, they want to link up with industrial production systems; that is why there is such an emphasis on consistency and system, which has led to homogeneity in theory and architectural form. But while systematic formal research originally aimed at standardised and abstract elements in order to make serial production possible, modernism was increasingly defined in aesthetic terms. Neo-modernism, that for some time now reigns supreme in the Netherlands, has no longer been concerned with solving problems posed by material, but only with playing games with the physical appearance of buildings.

For that matter, this shift follows developments within the avant garde itself, in which different groupings quickly made their appearance. The dadaists and surrealists especially, broke with the strict requirements of the research of forms: dadaism took procedures and materials from mass culture, surrealism emphasised the importance of the spontaneous approach and the uncontrollable. But the project of the modern has been chiefly undermined by a contradiction which was inherent in it from the beginning. On the one hand formal research is used as a norm for formal objectivity, on the other hand a demand couched in moral terms is made of the architect: as liberator of mankind he must be capable of changing social structures by means of his designs. Postmodernism is a clear reaction to this.

According to philosophers like Foucault, Derrida and Lyotard, modernist ideas about the liberation of man through rational understanding have turned into their opposite: a technocratic normalization, in which rational humanism often forms the legitimization for new techniques of power. According to them, homogeneous and universal truth does not exist. Every structure in science, art or architecture is the expression of a power game, a temporary construction of codes, and therefore
Whenever it has petrified into a system of rules, it must be dislocated, fragmented, deconstructed. I will return to this.

Under rationalism I would include the approach to the city developed in the 1950s and 60s by Muratori. This approach has been applied in practice by Rossi, Aymonino, Panerai and Castex, and put into operation as broadly accepted typological research in the context of a rational architecture. Whereas the power of modernism is most visible in building production, rationalism developed chiefly in institutions for training and research. Until the 1980s typological studies were the common denominator of numerous renowned institutions. In contrast to modernists, rationalists seek the common the universal not in the future but in the origin of architecture. They do not bind their methods to an idea about the emancipation of man. On the contrary, they like to brandish what they posit as the autonomy of architecture and therefore of the architect, who is only responsible to a limited extent for social developments and only has to answer for his own work. Rationalism seeks its guidelines in existing forms: it observes, documents, compares and classifies buildings made in the past which are seen as ‘precedents’, comparable to ‘precedents’ in jurisprudence. The cool and objective look of the systematist seems to have replaced the devotion of the believer, but rationalism has this in common with modernism: it looks for a norm-setting authority for formal experiments in a universal idea which is free of a specific historical context. As omniscient narrators, modernism and rationalism both produce an unambiguous and linear story which leads to one future and one origin respectively. Both tendencies regard architecture from a paradigmatic viewpoint: within a relatively large group of architects unanimity should exist with regard to goals, methods and the products to be realised. Under pluriform social conditions therefore, functionalism and rationalism are a less adequate approach.

With these comments I have tried to sketch the diffuse field in which architectural culture finds itself in the 1990s. Training and research have failed to come up with a response to either the golden era, or the crisis. Under pressure from cutbacks in spending, the ongoing undermining of the academic status of the institutions has accelerated since the beginning of the 1970s. While in the Netherlands, commission after commission has examined architectural training and research, the faculties of architecture of the Polytechnics are diligently searching for new contents and form for training and research programmes. In discussions on this, confusion has arisen.
through a lack of clear definitions. Architecture is identified with designing, designing with styling and so on. Furthermore, technology is placed next to design and research as if technology as such did not consist of design and research. Besides, design is placed opposite research, as if design studies in which research occupies a central place did not exist. The series of examples which you saw during my lecture is intended to remind you of the existence of such studies. They fulfil an important function in architectural culture but unfortunately have not yet been accepted in the university as serious scientific research.

I am of the opinion that you can indeed see designing as a research activity. Teachers of architecture at this faculty carried out such research in the past in their architectural practices. That no longer happens. Research should therefore take place in the faculty itself, for example by regarding the design as the object of empirical research. However, at this university of technology people are mainly taken with empirical-technical research and the diffuse situation of architectural culture ensures that each research proposal is immediately branded as wrong by other architects. Thus, there seems to be no room at Dutch universities for design studies, and we may be relinquishing control of the development of the profession to journalism and the theorizing of the art-historical sciences.
J.B. Bakema, Pampus-plan, Amsterdam 1965, project
When is designing also research?

TEAKE M. DE JONG

Introduction

Some futures can be predicted, others must be designed. This leads to two groups of methods, two professional groups, two linguistic games which concern themselves with understanding and capacity, the probable and the possible respectively.*

As the concept of 'probability' is linked to causality, so is 'possibility' linked to conditionality.¹

Designers have difficulty with the concept of causality. After all, if a design can be predicted along causal lines, it is no longer a design. Besides, designs do not always lead to a particular future, a particular experience, or a particular use: they only make these possible. A house does not enforce a particular household or experience, but creates the conditions for different households and experiences.**

That is, the function of a building cannot be completely understood in terms of simple objectives.²

Now, if a researcher is to be granted research to carry out, it is required of him beforehand that he formulates a clear statement of the problem, objective, recognised scientific method and some idea of generalizable results. It is as if Van Leeuwenhoek (the seventeenth century founder of microbiology) had been told by his patron: 'You can develop that microscope if you draw for us the animals you want to discover with it.' It is not only architectural and urban design research, but the entire field of technical design research, which is wrestling with this problem, that inventions are not honoured beforehand and discoveries are. It also has the consequence that the inventor does not publish anything as long as he has to live from his invention.***

* My published treatise Kleine Methodologie voor ontwerpend onderzoek (Boom, Meppel, 1920) seeks shared foundations for designing and the classic scientific explanatory, predicting and problem-spotting research.

** The treatise therefore also takes a step backwards into the broader field of conditionality. It even sketches the implicit non-causal conditions of the causality itself!

*** See also the article 'De onzichtbare tehnneut.' NRC Handelsblad.
The problem of the setting of objectives for systematic design-oriented research is related to the demarcation criteria for the scientific basis of the method, if you do not want to confine yourself to causal explanations.

From values to conditions
The Methodology committee of the Faculty of Architecture of the TU Delft has drawn a distinction (for the time being for the benefit of teaching only) between ends-oriented and means-oriented research:

<table>
<thead>
<tr>
<th>ends-oriented</th>
<th>means-oriented</th>
</tr>
</thead>
<tbody>
<tr>
<td>$f(E) = M$</td>
<td>$F(M) = E$</td>
</tr>
<tr>
<td>1. Explanatory</td>
<td>5. Design research</td>
</tr>
<tr>
<td>problem-spotting and predicting</td>
<td>6. Designing</td>
</tr>
<tr>
<td>2. Programming</td>
<td>7. Design-strategic</td>
</tr>
<tr>
<td>3. Optimalising</td>
<td>8. Technical research</td>
</tr>
<tr>
<td>4. Evaluative research</td>
<td>9. Development of instruments</td>
</tr>
</tbody>
</table>

In the first case (1 to 4) social objectives (E) are chosen as the independent variable to find resources (M), in the second case the resources (M) are first varied and then it is asked who is to benefit from this (E).

For example, when housing shortages, unemployment or discrimination appear on the government agenda ends-oriented research comes under pressure to see how these agenda points can be converted into researchable problem formulations and research objectives. The other way round, it is naturally important for these researchers to spot social problems and in this way get them onto the government agenda.

From this research designers can learn above all to what extent existing, executed designs meet the interests of particular groups and how such interests can be optimalized in a design.
This leads to 'design guidelines' from the social, psychological, biological and natural sciences sectors. The number of research reports with design guidelines has by now expanded into kilometres of bookshelves. For designers, this has lead to the classic ends-oriented research suffering from reduced returns.

The means-oriented research also casts its nets on the other side and varies the design resources independently in order to check which objectives gain from this.

The objection can justifiably be raised that the distinction between objectives and resources cannot be fixed at a single point, but differs and shifts from person to person and from research to research. What for one is a means to social objectives, the design for example, is for another a goal, and for him felt-tip and pencil the means for a design. However, is this also true of the opposed points of view of ends-oriented and means-oriented?

No.

My treatise indicates the line on which at every point the conversion from resources to goal can be placed.

**Conditions-oriented scientific research**

The awareness that explanatory (whether causal or not), optimalising and evaluating research does not always result in the exploration of the possible, is vaguely present in the university tradition.

In this tradition experimental research, the 'game character' of science (not always aimed at familiar social goals) and the 'independence' of scientific research occupy an important position. These classical principles however, have often led to hobbyist or immoral excrescences of scientific activity. Freedom is too often abused, so that people have retreated to solid, verifiable causal methodological principles as the demarcation criteria for science.

This consequence, fatal for the research which underpins design, demands a new methodological debate and missionary work to the research programme institutions.

Whereas a foundation is a condition for a building, a foundation does not imply or cause a building, it only makes it possible. Every cause is a technical condition, but not every technical condition is also a cause.
That is why the concept of 'technical condition' is a central concept for designing research and at the same time, the root shared by design and the search for causal connections (researching in the narrower, predicting sense).

The resources-oriented research must now take a step backward without losing its scientific nature, with regard to causality in the broader field of conditionality. In any case, modern physics has already blazed the trail in this dethronement of causality.

'Without loss of the scientific basis', means refutable, verifiable and generalizable results of research. The generalisability of design research in particular is a problem as long as each design is a unique event. Architectural designs specific to their sites are difficult to compare. This would appear to be possible by not studying different designs in their totality, but imaginary changes in a design. In this fashion the design research becomes designing research. These changes or 'design-interventions' can be placed as 'added conditions' in a series of conditions which assume each other. In this fashion not only can the design-interventions be evaluated for their effect, but above all also for their conditionality. The question then becomes 'Under which conditions can I make use of such-and-such a design-intervention and which new values (objectives) does this bring within my reach'. Possibly this will also shed new light on the 'ceteris paribus' assumption in causal research: 'Under which conditions is an explanatory causal relation valid, and how can these conditions be further described and classified?'
NOTES

1. Predicting research focusses on probable futures, designing on possible futures. Now, the collection of probable futures is necessarily a component of a much larger collection of possible futures. What is probable is after all by definition also possible, but not everything which is possible is also probable:

POSSIBLE (designing)

PROBABLE (predicting)

DESIRABLE (desiring)

We cannot therefore always predict what is possible, we must design and/or desire it. The politicians and policy-makers take note of what we all want together. Whether this is also possible, has to be determined in dialogue with the technicians (designers).

However, the diagram gives another possible interpretation which clarifies the comprehension of the contents of policy documents on which scientists, administrators and technicians have worked together:

FORMULATION OF THE PROBLEM

OBJECTIVES

RESOURCES
The futures which are desirable and at the same time probable are not interesting from a policy viewpoint. After all, we do not set up a committee to ensure that tomorrow will be another day? That is desirable but also so probable that it can form no grounds for action. In general a policy document begins with a description of the probable, but undesirable futures. This is called 'formulation of the problem'. This chapter is usually written on the basis of explanatory, predicting and problem-spotting research. There then follows a description of possible futures which are considered desirable. These are called 'objectives'. They are based on values and are developed by policy-makers in dialogue with technicians into norms and programmes of requirements.

Finally, the intermediary stages with which it is considered possible to achieve these objectives are described: the means. These means are often outside the sphere of the desirable ('the end sanctifies the means'), but belong to the sphere of the possible. How are these means developed (possibilities, conditions)? They cannot be predicted, they must be designed.

Predicting researchers, designers and administrators reduce their reality to various linguistic games:

<table>
<thead>
<tr>
<th>Linguistic games:</th>
<th>to be able to</th>
<th>to understand</th>
<th>to choose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Categories:</td>
<td>possible</td>
<td>probable</td>
<td>desirable</td>
</tr>
<tr>
<td>Sectors:</td>
<td>technical</td>
<td>science</td>
<td>administrative</td>
</tr>
<tr>
<td>Activities:</td>
<td>design</td>
<td>research</td>
<td>policy</td>
</tr>
</tbody>
</table>

Reductions according to
- type: key to symbols, variables, agenda
- place and/or time: tolerances, relations, agreements

When the designer lays down the *key to symbols* on his drawing, for example, red for urban area, yellow for agriculture, blue for water, then in doing so he is reducing variation within the urban area, the agriculture and the water. When he designs his plan in presupposed symbols units he first chooses roughly and later more precisely their location and form (state of distribution). During the design process he reduces the *tolerances* of the design for the sake of the realizability.
The designer also designs in presupposed symbol units when he does not yet know precisely what his colours are going to mean. After all he assumes that the various colours used by him mean something different. These differences do not need to be verbally distinguished in order to presuppose a meaning.

The concept of 'tolerance' as permitted deviation of prescribed sizes or dimensions is not being used here in the narrow sense of agreements within manufacturing processes, but in the broad sense of the entire process of planning for execution. The researcher reduces reality to variables, but refuses to accept that a variable can assume any random value. He looks for relations between the variables in order to restrict their freedom of movement for the purpose of being able to make more precise predictions. The policy-maker reduces the problems to a number of agenda points and tries to reach consensus in agreements.

Suppose for example that the composition of the evening meal is on the agenda, then that is a reduction of reality to type. The aim of the meeting with regard to this point on the agenda can now be to agree upon who does the shopping, who prepares the meal and who washes up. In other words, it is a question of the curtailment of the behavioral alternatives of the participants in terms of place and time. The agreements are then written in the 'agenda' giving place and time.

2. A building is never a social end in itself, but a means to many, partly unpredictable social and individual ends. Considering its depreciation over time and for the benefit of its future value, it must even remain utilizable for different ends, even if it has been made for a single end. What is the 'goal' of the city, of nature? They are conditions of our existence without which we could not even set ourselves goals. Perhaps it is possible to propose human freedom of choice as the goal of the city, but this objective is so vague that it could be used to defend every design decision.

No, there is a technical science concerning condition-creating design means which is much older than modern science: architecture. This has stood the test of time through centuries of changing objectives with always the same design means. Naturally, in evaluating research the question has to be constantly asked whether these means can still be appropriate, naturally the search must continue through designing research for new architectural means which are made possible by technology, but an architecture which is too focussed on current problems is no art.
3. Spatially relevant individual and social goals however, are bound to time and place. Their number grows linearly with the period which has to be taken into consideration and quadratically with the built surface. If design guidelines had been formulated from all these goals, then the planner would never have got around to designing.

4. No matter where the border between end and means is to be found, it is always possible to take two diametrically different viewpoints. This viewpoint now determines the research method in the sense intended here. The crucial question them looms up of the bilateral lines of sight along which ends and means move. How can the border be indicated, from where a person or institution in a given situation calls something forward-looking an end, and something looking backward a means? It is a point on the more abstract line between conditions and values which I have developed in my treatise.

<table>
<thead>
<tr>
<th>CONDITIONS</th>
<th>VALUES</th>
</tr>
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<tbody>
<tr>
<td>A1 A2 A3 A4 A5 B1 B2 B3 B4 B5 C1 C2 C3 C4 C5</td>
<td></td>
</tr>
</tbody>
</table>

End-oriented: >---------------->-----0
Means-oriented: 0----<------<

The encoding runs from abiotic conditions (A) through biotic (B) to cultural (C) values. I assume that each culture has its abiotic and biotic conditions. After all, it is not possible to consider Biotic phenomena without Abiotic phenomena, but it is possible the other way round. Nor can any Concepts or Culture (the collection of collective concepts) by considered without a Biotic bearer, but it is possible the other way around (ABC-model):
A. van Eyck, Nieuwmarkt, Amsterdam 1970, project
The horizon of design
Role and context of urban design studies
ERIK PASVEER

Conceptual framework
The issue of 'design studies' in architecture and urbanism does not fit in our conceptual framework, traditionally dominated by two contrasting positions: Urban design as either a technical operation or as a cultural expression.¹

The adherents of the first approach believe that designs must be derived from a set of well determined planning objectives and should result in a realistic proposal for building activities. In this case, a design is synonymous with a plan, a document representing the future spatial reality of a particular site. Urban planning is seen as a series of successive stages (survey, design, implementation, administration) and corresponding actions (to assess urban needs, to determine objectives, to propose a plan, to exploit urban space). This implies a particular idea of the city, because urban space is supposed to provide accommodation for certain urban needs.

We inherited this model from the age of explosive urban growth, when architects and planners linked the world of urban design to the world of industrial mass production. Inspired by the successes of the assembly line, planning regarded itself as scientific management of urban growth and adopted the corresponding concepts and methods. Urban design was seen as a particular skill only to contribute to a particular stage of urban planning, just one step between socio-economic survey and technical implementation. Not only was urban design entrusted with a particular responsibility, i.e. the conversion of objectives into a

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plan, it was also excluded from other fields, such as the analysis of data and the construction of aims and criteria, which became the sole responsibility of specialized planners and researchers.

Supported by a highly respectable tradition of study and experiment, the ultimate perspective of this approach is to make the process of design transparent, or rather, following the principles of assembly line production, to replace it by an optimized and automated system. This was indeed the case for every single stage of urban planning, in order to streamline and control the whole process of mass producing an urban environment that would, in the end, perfectly match with the scientifically determined urban needs.2

A similar conception is inherent in the opposite approach, which considers urban design as 'cultural expression'. In this case, a product of design is seen as a historical or personal document reflecting the cultural context, rather than the technical objectives of design. Supported by an intellectual heritage no less respectable, this approach assumes that urban space and urban design reflect the original socio-cultural circumstances in material documents like drawings and buildings. Design is regarded as the production of social evidence. While the 'technical' position looks ahead from the once determined urban needs and at the end of that process discerns the outlines of urban space as an accommodation of those needs, the 'cultural' position looks backward and discovers in the drawings and buildings the outlines of some historical period or personal life.3

Diagram of the 'technical' and the 'cultural' view on planning and design, both assuming a transparent design process
Therefore, although these two conceptions of urban design have constituted the elementary contrast that dominated the debate on urban design in The Netherlands for more than a century, they are in perfect agreement on one point. They both assume the output of a design process to be simply a representation of its input in a different form and so they deny the process of design itself any significance of its own. Whether technical operation or cultural expression, a design process ought to be transparent; consequently design itself is rendered invisible, beyond the horizon of our conceptual framework.

However, the issue of design studies assumes a design process to have some significance in itself and therefore it reveals another conception of design. This conception does not reduce design to technical operation or to cultural expression. It recognizes design as a particular way to acquire knowledge, as a study by means of its own resources. It recognizes the intellectual quality not only of all those well-known experimental designs by prominent architects and urbanists, but also of the innumerable competition entries, sketches, tryouts and unbuilt projects that have remained anonymous or have long been forgotten. Taken as products of technical operation, these designs are failures, because they were not implemented and therefore superfluous plans. Taken as products of cultural expression, these designs are meaningless, while they are no transparent representations of social or personal life. But regarded as contributions to the ongoing development of design itself, these designs constitute the archive and laboratory of design and their significance can therefore hardly be overestimated.

But if we recognize today the wider intellectual capacities of design, i.e. if we recognize the potential use of design as a research instrument, we also assume a different model of urban planning.

**Towards a different model**

The traditional model of urban planning, inherited from the age of large scale urban expansion, has lost its credibility. This is often explained by arguing, that this model has simply failed to achieve its general aim to create an urban environment that matches with urban needs. It is obviously true, but this explanation of the 'crisis of planning' still evaluates the old model by its own standards and therefore it only leads to a more sophisticated version of the old notion of urban planning as scientific management of urban growth, i.e. it leads to more socio-economic
research, more computerized administration, more complex procedures, more advanced building technology etcetera, but not to that essentially different model of planning that would allow for a meaningful understanding of the role of urban design studies.

This other model may be found if we take the condition of urban space as a starting point, rather than the conventional principles of urban planning. The shift from urban expansion to urban renewal in the post-war period has brought about a different role and conception of urban design. Interventions in existing urban areas require, for example, negotiations about claims of various interested parties. This undermines the notion that urban planning must be based upon scientifically determined urban needs. Designers often work without well-defined planning objectives. Furthermore, full and immediate implementation of a proposal in an existing urban area is highly uncertain, because of the often dynamic conditions of the site at stake. Consequently, the notion of design as technical operation, based upon a program and aimed at implementation, falls apart. In fact, the reality of an almost fully urbanized territory resists the whole idea of mass producing urban space in a linear, finite, step-by-step process; it resists the principles of scientific management.

Design studies derive their significance from a different approach towards urban development. This approach is not a newly constructed 'academic' planning model, nor an improvement of the traditional model. It is rather a systemization of practical experiences of planners, designers and others involved in the successive post-war periods of urban reconstruction, rehabilitation and revitalization. It has not yet reached the status of a fully worked out, consistent theory, but it exists in fragments of plans, projects and experiments, of debates, studies and commentaries dealing with the present condition of the urban territory. From these fragments we can reconstruct the outlines of this approach and describe its implications for the conception of urban space, the model of urban planning and the strategies of urban design.

**Elements of a new approach**

**Urban space**

Urban space can no longer be regarded as a liquid mass extending uninterruptedly across a smooth, unresisting, immaculate subsoil towards some well-determined,
final destination: *The City of Tomorrow*. The urbanized territories of today are in a state of permanent metamorphosis, they consist of layers of urbanization over earlier layers of urbanization, *a stratification*. They are filled with numerous material and immaterial data (buildings, infrastructure, investments, claims, expectations, memories) which offer resistance to interventions. A building site is no longer considered an empty surface on which plans are to be projected, but occasions offering unexpected opportunities, challenges and risks. Rather than a static accommodation, urban space is now regarded as *a dynamic resource*.

**Planning model**

The model of scientific management of urban growth, borrowed from the world of industrial mass production, is being replaced by the model of strategic management of urban resources, which is also derived from policies developed and applied in trend-setting economic sectors. Unlike single factories operating on single, rapidly expanding markets, very large companies, such as most of today's multi-national enterprises, offer a wide variety of products and services on often saturated markets. Their aim is long-term continuity, rather than rapid, unrestricted, massive growth. They have learned to stimulate demand rather than provide accommodation and understand that to adapt their organization and to differentiate their products and resources are essential conditions for success.

In recent years, similar notions have been introduced in the field of urban planning and design. The intention of the so-called 'planning by seduction' is meant to stimulate investment rather than to accommodate needs. Cities assign special qualities to almost every single site in an attempt to offer differentiated and attractive housing, working and leisure environments. In order to adapt to the ongoing changes in the planning environment (budget-cuts, deregulation etc.) the planning apparatus of almost every larger city in The Netherlands is being permanently reorganized.

The implications for urban design are huge. Unlike the famous general plan for the expansion of Amsterdam, that lasted from 1935 to 1985, the strategic urban plan for Rotterdam from 1987, does not provide a *spatial framework* for urban policies. It offers a flexible and differentiated package of analysis, aims, criteria and guidelines, for example on urban economy, on education, on municipal organization and on planning capacity, but not a blueprint for future urban space. Strategic urban plans
are not meant to control the expansion of urban space, but to organize and direct urban resources.  

The significance of urban design has changed accordingly. An urban design study is not meant to provide a long term and large scale blueprint, but it may be used as a tactical instrument to examine, indicate, evoke and explore those resources by testing the spatial capacity of a particular site or by showing the spatial consequences of a particular scenario.  

Consequently, urban design assumes part of the role of the traditional town planning survey. Strategic urban management may lead to a complete reversal of the conventional sequence of planning stages: research, design, implementation, administration. In order to prevent urban deterioration and to enhance urban resources, an already implemented project may serve as the starting point for a series of design studies resulting in an assessment of the potential significance of the site. The final step would be to trace, address and involve interested parties, which would have been the first step in the conventional sequence.  

**Design strategy**

The permanent metamorphosis of urban space requires permanent production of designs, while it requires a permanent exploration of its resources. The ultimate goal of a design process is not a final solution. It is part of a continuous flow of proposals reacting to earlier designs, evoking new designs, over and over again.
Consequently, the conventional framework of notions, principles and criteria to discuss and measure quality in urban design loses its significance. Design studies assume a different notion of quality. To understand this, we must distinguish urban design studies both from conventional plans and from conventional planning surveys. Unlike plans, design studies are not necessarily based upon a traditional set of objectives. Therefore, being programmatically functional is not a general criterium. Nor are they aimed at implementation. Therefore, its technical performance is not a general criterium either. But there are two other keystones in the design process: the interpretation of the site and the planning environment. Therefore, being appropriate for a given situation and being productive for a particular procedure are two general criteria for urban design studies.

As a research instrument a design study must be sufficiently consistent and systematic in order to be understood, evaluated, improved and processed. These criteria also count for a traditional planning survey. The status of theory, however, is different. A traditional survey derives it's consistency from more or less explicit, systematic, formalized theories. The theories of design on the other hand, are rather implicit, fragmented and provisional. Unlike traditional research, a design study does not refer to a theoretical model or to a set of clearly worked out hypotheses. It's strategies are explorative and inductive; a 'theory of design' is

Diagram of criteria for urban design studies
produced like a work in progress, over and over again, within the process of design itself. It derives its standards of consistency from its own world, by referring to design precedents for a particular site, precedents which are part of the history and theories of urban design itself. This is why a design study has some advantage over a survey. It concentrates on the interpretation, rather than the collection of data; it offers concrete solutions rather than abstract statistics; it is not restricted to scientific probabilities but can reveal and create new and unknown possibilities. An urban design study is, after all, nothing but a study by means of urban design.

The contents of a design study, although with a different role and perspective, is similar to a traditional spatial urban plan. Although being implemented is not their general aim, design studies must be sufficiently realistic in order to convincingly show the capacity of a site. An urban design study is also a medium for communication with a heterogeneous audience, not only of professional experts, but also of other interested parties. Therefore, it must also be sufficiently expressive in order to stimulate discussion, to ensure the progress of planning procedures and to appeal to the aspirations of the parties involved.

Conclusion and questions
Realism and expressiveness. At this point we have returned to our initial elaboration on the contrast between the two dominating conceptions of urban design in the Netherlands: urban design as a technical operation and urban design as a cultural expression. The issue of design studies can be considered not only as a response to the present condition of urban space, marked by the shift from urban expansion to urban renewal, and the present condition of urban planning, marked by the shift from scientific to strategic management. It also indicates that we are about to overcome a conceptual framework that for a hundred years or more reduced a design process to transparency and thus rendered the world of design itself invisible.

The recent flood of design products for urban renewal has once more invoked the old dilemma. These designs were often explained as nothing but seductive images and fancy advertisement expressing a new, attractive notion of urbanity, thus resuming the reduction of urban design to a medium for cultural expression. On the other hand, the same designs were strongly criticized as impotent proposals and unrealistic plans that can and will not be implemented, thus resuming the
reduction of designs to a strictly technical operation. And if we now would argue, that those designs are only provisional experiments, aesthetic exercises, we would only introduce just another reductionist option.\(^\text{13}\)

An urban design study can not be reduced to either a technical plan, or a cultural expression or an experimental research instrument, for it has the distinct capacity to perform those three roles simultaneously. To recognize that full intellectual capacity is to recognize the world of design itself, not as a license for unconditional intellectual exercises, nor as an invitation to impose socio-scientific standards on urban design. Design has its own standards of rationality.

The position and competence of the disciplines involved in the current policies of urban management, the relations between the fields of research, design, implementation and administration, has not yet crystallized. It is therefore necessary that in the next few years universities, other cultural institutions, planners and designers, will investigate and discuss the practical experiences of managing existing urbanized territories.

A second issue for further investigation is the evaluation of design studies. When several studies for a particular site are made, each one being equally functional, realistic and appropriate for the given site and procedure, then what standards are required to distinguish their respective qualities? If they are equal but different, which often enough will be the case, then the answer to the question of quality must be found within the horizon of design itself.

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**NOTES**

1. These two positions were extensively discussed in Wouter Bolte en Johan Meijer, *Van Berlage tot Bijlmer. Architectuur en stedelijke politiek*, Nijmegen 1981.


Le Corbusier, for example, was deeply impressed by the production of cars in the Ford factories and argued that buildings and cities ought to be produced in the same way. In the chapter 'mass-production houses' in *Vers une architecture* he writes: 'A question of a new spirit. I am 40 years old, why should I not buy a house for myself? for I need this instrument; a house built on the same principles as the Ford car I bought (or my

For a summary of this conception: H. van de Cammen en L.A. de Klerk, *Ruimtelijke ordening. Van plannen komen plannen*, Utrecht/Antwerpen, Uitgeverij Het Spectrum 1986, especially chapter which deals with 'Order through knowledge'.


The notion of design as cultural expression is also practiced by designers themselves. There are countless examples of architectural styles aiming to express the culture of technology, the culture of democracy, the culture of consumerism etc. in urban space.

I am referring to the experiences of urban reconstruction after the damage from World War II, to the renewal of the inner city areas in the 1960-s, the rehabilitation of 19th century neighborhoods in the 1970-s and 1980-s and the revitalization of old harbor areas and deteriorated industrial plants in recent years. Theoretical notions against the conventional model of urban planning, often based upon experiences with projects for existing urban sites, have been put forward by leading designers such as the members of Team X, Aldo Rossi, Rob Krier and many others. These notions have found their way to planning practice and to the theoretical debate on urban design. The same counts for experimental strategies for urban renewal in for example Berlin, Vienna, Bologna, London and Barcelona and Rotterdam. Some of the practical experiences with urban design in urban renewal in Rotterdam along with their theoretical implications have


11. Examples of the use of urban design to test the capacities of a site are numerous; today, design studies are frequently used as a preparation for almost every larger project. Examples of experiments with the use of urban design studies in scenarios can be found in Dr. H. van der Cammen (ed.), *Nieuw Nederland. Onderwerp van ontwerp*, Stichting Nederland nu als ontwerp / Staatsuitgeverij 's-Gravenhage, 1987.

12. For the notion of continuous planning: H. van der Cammen and L. A. de Klerk, op. cit.

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The tower of Pisa - the tower of Delft

JAN MOLEMA

As long as the tower stays standing while it actually should fall, the tourist will visit Pisa. Italian engineers may be more stupid stupider than their Delft colleagues, but are perhaps cleverer. While in Italy, and far beyond, the threatened fall of Pisa's tower is constantly discussed, Delft's tower has long been assured against collapse with invisible means. The question is, which is more important: worldwide fame for a possibility which will perhaps never become a reality, or a reality which is not experienced.

This is the area of tension in which architect and engineer work. While the architect wants to increase tension in people to the apparently unbearable, the engineer does that, with the tensions in the building. Where one, with a factual understanding of forces and stresses is able to evoke a dream world in which everything is different than you imagine, the other is able to evoke a world in which everything is as you think it is. With our training, we can aim to unite the two, architect and engineer, in a single person.

Where this training deals with material and physical structure in architecture, it can be expected that these will be studied for their physical qualities and their psychological impact. While the engineer has the tendency to concentrate on the former, the architect on the other hand often find completely different considerations, which however mostly have little scientific depth. Today we should discuss the question: should training in architecture be scientifically oriented, does that obstruct creativity or is creativity actually stimulated by it? Can or should a debate on this be scientific? Is designing research possible or are we dealing here with a 'contradictio in terminis'? But we should also speak of what is the importance of material and physical structure in architecture. How does the designer treat this?
Historians have often pointed out, and at length, how in the nineteenth century the architect lost contact with technology, material became a decorative means, the real problems of construction were concealed behind the wallpaper to be solved by others. Whether this is true or not, it can be concluded that not every architect has the same interest in the problems of the materialization of an architectural idea and that not every theoretician attaches equal value to materials and construction as to architectural means. It can also be stated that in recent decades, in our faculty, fundamental designing research has only taken place in passing. This is certainly true of the type of research in which the materials and their composition - the physical structure - were examined in terms of their potential for forming architecture. Here I am supposing the physical structure as one of the three components of architecture, alongside the spatial and the functional, the latter to be understood in the broadest sense of the word. At the moment, as Jan Brouwer and Mick Eekhout will explain, we are working hard in our faculty on increasing interest in the designing of products and systems in which these products can be used.

I will here give a quick review of a number of other studies which have been begun in The Netherlands in recent decades and which can be earmarked as researching designs or designing researches with regard to the physical structure.

In the 1960s, the Stichting Architecten I ±search developed the so-called SAR system. Professor Habraken, known from MIT Cambridge, was the pioneer in this. This research took place to a great extent in the architecture faculty of the TU Eindhoven. Maarssenbroek near Utrecht is the most striking example of the SAR system in building practice. The system is mainly a structure of agreements on the position and size of building components.

In the 1970s OBOM developed a method for 'Open Building'. This study was initiated by Prof. A. van Randen of our Faculty's department of Architectural and Urban Planning Technology. A short time ago Prof. Jan Brouwer took over the work from Prof. Van Randen. OBOM is concerned with the position, size, and capacity of building components which are developed in the building industry and attempts to attune these building components to each other. Both SAR and OBOM have had their greatest impact in the building of mass housing.
The SAR method in particular seems to have little to offer which could be elevated to architecture. The system is too compulsory and too emphatically present and too much an end in itself. It is too little concerned with architecture as an end; in so far as that is the case, the architectural quality achieved is low. There is no architectural tour de force we can point to which has been built with, or thanks to, the systems mentioned.

I want to discuss here whether the systems of agreements sought can guarantee the creation of Architecture. I want to ask also whether the sort of research which was begun in our department by Prof. Moshé Zwarts (designer of the Dutch pavilion in Sevilla) and will now be continued by Prof. Mick Eekhout, that is, the development of products for building by training engineers to do this, can lead to architecture.

To my mind, it is justifiable to ask whether architecture is a question of putting the right elements with the right dimensions in the right place. This question can be answered with a negative, or with 'yes, if...', but not with a simple affirmative. Otherwise, what should we think of the Japanese pavilion at the Expo in Sevilla in which Tadao Ando displays 'tie-bars' which cannot function as such, and are also not 'tie-bars'? Ando tricks us, wrong-foots us, challenges us to discuss and make statements. Ando makes Architecture.

Apart from the development of the physical presence of the construction and the building element, designing research in the Netherlands should concern itself with stimulating the inventiveness of the designer with regard to the use of elements which do or do not exist. The designer must be capable, as it were, of controlling even the potentials of non-existing products in such a way that the need is created to realise these products for an objective which is not set beforehand. On the other hand, a product must be able to provoke the designer to unsuspected applications: 'Ceci c'est pas une pipe'.

In the 1970s, people worked with this idea on the Vietnam project and on Gimmieshelter, two study projects initiated by students of our school. Both were a consequence of the democratization of the university and led to an imaginative research of simple industrial products. Detachable, moveable container building systems such as the Dutch Fort system were studied for usability and further
developed. From this came the hospital which Prof. Carel Weeber built for the Vietnam Medical Committee and the student housing Gimmieshelter a few hundred metres from here, for which currently well known young architects, then students, formed the architectural partnership. In this context we can also mention the competition set by the City of The Hague for moveable ateliers in The Hague. The first and second prizes went to members of this school for the development of the system buildings which could be rapidly assembled and dismantled. The fact that it was this school which trained architects with the title of engineer has always led to building technology being treated in a spiritual manner. This made it possible to turn out architects like Duiker or Hertzberger.

A similar training produced Gaudi in Barcelona. However, equally important is whether the 'ordinary student' can be lead to an inspiring and inventive use of technology and its products. This appears to me to be the essence of the task of current and future training in this school.

For twenty years I have been concerned with the question asked earlier: is architecture a question of putting the right elements in the right dimensions in the right place. Or rather: what is right? I have come to a conclusion which is by no means new, that it is precisely where the architect consciously deviates from the fixed codes that surprises arise which can be called architecture. This is true for both a composition of elements - from the level of the city to that of the chair - and for the elements in themselves. In that sense the goal of the building technologist is not in conflict with architecture but can contribute to architecture. It always comes down to the ingenuity with which a designer handles knowledge and means. If the norm, the rule, is not the goal but the point of departure, constantly tested for validity, architecture will become accessible, and a synthesis can be made of building technology and architecture. These conclusions arose after research of the work of extremely diverse architects from different periods.

Designing research must also concern itself with the products of preceding architects, with the effect these products have on us; we must know how these effects are created and how the designer incorporated them into his building. These are essential elements of the studies which we, teachers and students, have been carrying out in this faculty under the collective term Analysis of Buildings, for the last twenty years. The best known studies with regard to well-known architects
have been carried out by the Delft Gaudi group, the Duiker group and the Wiebenga group. The published books and exhibitions illustrate the originality of these architects in their treatment of building technology, rationality in the design process, and the inventiveness of the architect-engineer in the formation of concept, design and material application. In this context there have been high-level achievements. One of the members of the Gaudi group, Jos Tomlow, prepared and guided, at the Institut für Leichte Flächentragwerke of Frei Otto in Stuttgart, the reconstruction of the most intriguing design model before the computer: the hanging model which Antonio Gaudi developed for his magnificent chapel for the Colonia Guell. A member of the Duiker group, Wessel de Jonge, together with Prof.ir. Hubert-Jan Henket of the TU Eindhoven, set up and carried out the exemplary building technical study of Jan Duiker’s Sanatorium Zonnestraal, the most important monument of the Nieuwe Bouwen in the Netherlands. And what can I say about my own discoveries in the work of Gaudi in which statics, physics and geometry played leading roles in the design process? The discovery that Gaudi must have recognised the use of the catenary curve in the Maya arch of Labna is a fine illustration of identification of the unexpected, the thrill of art, the emotion that is inherent to real art.

I have been asked which sort of research is desirable or necessary. The general answer is difficult to give, I believe. It is clear however, that with research at the university you can kill two birds with one stone: teaching and research inspire each other. Teaching through research - research through teaching. To sum up, I believe that product development as such should not take place in the faculty, that the training for this can be given by the faculty on condition that this has sufficient contact with other disciplines, that this training should also be about the socio-psychological qualities of the product:

1. Duiker’s patented concrete system was not buildable.
2. Gaudi turned his buildings upside down.
3. You cannot sit in Rietveld’s chairs.
4. Van Berkel’s bridge for Rotterdam is visually unreliable.
5. Wright’s prairie houses have stone plinths of wood.
6. The Tower of Pisa is still standing.

The architect - engineer knows why.
Quattro glass system, assembly
The Quattro glass system
A Dutch product development in architecture
MICK EEKHOUT

Approach
The scepticism of Jan Molema is contradicted by the many product designs and product development that were successful in practice. But apart from positioning of the right elements in the right place, one has to add more to technology before it becomes architecture and before building products become successful. For example after the soft social approach of the 1970's and the hard 1980's technical approach, we are now trying to combine opposing influences in different levels.

We have learned that 'soft' and 'hard' have their merits in existing separately, but get a more profound meaning when combined or juxtaposed.

The same is true for social philosophy and technology; for stress and relaxation, for fixed and free, for system and variable, for open and closed, for transparent and solid. It refers to a world-wide philosophy of two inevitable counterparts like Yin and Yang. One of the results of the clear design definitions in architecture of the last decade is that strong tensions are generated between two opposed dualities (and of course between many other parts of a design which are not discussed here further). In a number of architectural projects regular half-open facades (i.e. window facades) are interchanged with ultimately closed building volumes and their dual counterparts: complete transparent glass membranes. It is not so much the transparency here which is interesting, but rather this transparency in relation with closed surfaces or solid volumes. A similar clear statement of glass membranes between intersecting solid walls was given by the early Modernist architects of the 1920's. In the case of the product development process leading to the so-called 'Quattro' glass system being the topic of this lecture, this was the main architectural motivation: to develop new archetypal building components.
It was reinforced by a second, more technical motivation: to develop a glazing system for walls and for roofs alike, that would only need the ultimate minimum of metal component accessories like steel connectors and stabilizers. The strength property of fully tempered glass was to be utilized to its ultimate technical limit. The dream behind all this was to be able to make flat glass roofs without many steel components, surpassing the difficulties implied by the law of gravity. The route toward this goal was purposely directed via visible form-active structural stabilizing systems. So not simple mass-active structural systems like beams, or vector-active systems like trusses were to be utilized as the preferred structural system, but form-active systems with separate compression studs and tension rods, that display clearly their mode of action. It would ultimately lead to slender metal components, resulting in filigree and highly sophisticated large sized glass-and-steel membranes.

So product development performed by an architect means that even technical goals are seen through an architect's spectacles. This is what may be called an added value compared with product development by any market-realistic producer. We feel strongly that product-development performed by 'product architects' may have many more surprises in store with products suited for application in architecture.

In 1988 I introduced the term 'product architect' as distinct from the usual architect who design complete buildings for his clients. This architect would rather be called a 'project architect'. Our product architect is an architect who solely concerned with parts of a building: with the design and development of building components. Although many product architects may have a secret desire to want to design complete buildings every now and then, from my personal experience I can tell you that it is best to stick to either of the two professions: either you are a good project architect or you are a good product architect.

Doing both at the same time on the same level of quality is usually only reserved for exceptions to the rule like Renzo Piano and the London High Tech architects who make building designs as well as good component designs (but usually refrain from the actual further development).
Speaking of 'High Tech' it is time to realise that practically all components of a High Tech building are produced not on an industrial scale but more as prefabricated components in workshops and factories. The degree of industrialisation is usually quite modest for project-made components. But compared to the surrounding contemporary architecture, this High Tech architecture shows a higher degree of technology on the outside; it usually displays technology. Compared to the car industry or aviation industry we - in the building industry - are still some decades behind, so to speak. But it helps understanding what we cannot resist to use the term 'High Tech' as well as 'Low Tech' and in the Netherlands the more usual 'Middle Tech'(which is as high as we can afford within the existing budget).

One of the thoughts behind subtle structural design is that modern architecture has resulted in quite plain and monotonous treatment of materials that could do with some strongly expressive components, even if they were only made in glass. A parallel with the 18th century richly ornamented Dutch windows, some of which still can be seen along the canals of the inner town of Delft, comes into mind. They were also an expression of the sophistication of the intellectual 'enlightment' of that 18th century.

The goal definition for filigree glass structures is an architectural statement which in its turn caused a development process of mechanical and structural engineering that would have been impossible without a strong architectural vision at the start of this quest. We feel that apart from the many small improvements in innovation or upgrading of existing products, there is more impact to be expected from completely new products that preferably are derived from a broad vision of architecture, and not only of product development as a technology. Architecture must be viewed in all its context and movements. Future trends must be anticipated. And even more important: the products developed should have a positive impact upon architecture in its turn.

**Process scheme**

As the illustrated 'Organogram' indicates, the entire process of a typical building product development consists of 5 phases in total with 3 technical phases:

1. Concept Design
2. 3. Prototype Research and Development
3. 5. Final Product Launching

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Each of these 3 technical phases are connected by a consumer or market-oriented phase called successively:

2. Concept Marketing
4. Final Product Marketing

Together these 5 phases form an entity of process description, leading to what in the case of the Quattro glass system might be called an open Product System, rather than a final Building Product. Because in many different applications in architecture it could lead to quite different designs, depending on the architectural environment of each application with its specific set of boundary conditions, such as the approach of the architect, or the style of architecture, the tolerated liberty of the product architect, the location, size and form of the glass membranes, the mode of tendering, the hierarchy in the building process, the regime of product responsibility and the terror of the legal games after completion of the building etc. This particular Quattro product system is open enough to give an adequate reaction to the very different demands that time and tune are posed on the developed system every time again.

This versatility is illustrated by the very different results that have been obtained in the last 3 years with a successive list of projects like (amongst others):
- a glass fashion shopfront in Groningen (NL);
- a glass music hall in Berlage's Beurs in Amsterdam;
- a glass roof for a flower shop in Hulst (NL);
- an atrium glass pyramid for an office block in London;
- a glass entrance umbrella in Eindhoven (NL);
- a high railway glass wall in Stanstead airport (UK);
- an automobile exhibition building in Detroit;
- an exhibition entrance wall in Frankfurt;
- a high skyscraper lobby glazing in Hong Kong;
- earthquake resistant glass facades in Tokyo;
- a two-storey glass facade for a private house in Delft;
- an office lobby glazing in Hoofddorp (NL) and
- the central hall glazing of the Dutch Architectural Institute in Rotterdam.

All of these projects are illustrated in the slides that are shown in their own rhythm without direct comment, parallel to this lecture. The locations of these applications
indicate that the Quattro glass system has grown from a Delft design into a modest world product. Architectural approaches are similar all over the world nowadays, they are popularised with the speed of the circulation of glossy professional magazines and so good products in equal acceptance everywhere.

For us Product Development starts in architecture and will preferably have to end again in architecture. Although the development process itself is rather a design/technology orientated one, the two intermediate marketing phases ensure that the process objective which is (application in architecture) is never far out of sight. We know that negligence or omission of these marketing phases as technicians sometimes do in their enthusiasm, will lead to technical hobbism and completely failing products. The danger of failure in product development is immense as we are well aware of the fact that in the consumer market only 2 out of 100 products will be successful. However, in an industrial market like the building industry, the chances of failure for products not designed for a specific project may be smaller as the product requirements are more specific, and clients have a good understanding of the product. But in order to obtain a market larger than just one prototype building, it is absolutely necessary that all architectural marketing skills are put to work.

**Zappi**

In the meantime we have a distinct feeling that the best combinations of the current state of the art in material technology of high tensile steels, fully tempered glass (exactly cut to size by very accurate computer-operated water laser jets) and very sensitive form-active structural systems with normal forces like tension or compression taken by the glass panels, will definitely lead to an expression of our sophisticated high technology civilization. Thinking about progression in technology has even resulted in an initiative for a more fundamental research project to develop a new transparent material which is less vulnerable to brittle failure, has a smaller deadweight, but the same modulus of elasticity. This new fully transparent material is called ‘Zappi’. It has a name already but no chemical built-up or composition. Its development may take a few years, but then time is on our side for what do ‘a few years’ mean compared with the 5000 years that glass has existed? In view of the eternal values in architecture we are also reluctant to commit a religious suicide on glass. On the other hand because of the presence of the ever-transparent basic material, glass, our technological advancements are not
visually overwhelming but quite suitable and serving unmistakeably as a cultural expression. And we want to extend the borders of technology in favour of the quality of architecture.

**Development process**

Although the Quattro system has been developed in my private company Octatube in Delft, its early phases of development were accelerated by the work of students of this University of Technology. Three successive projects have been done by students of the Civil Engineering department in their final studies circling around the subject of structural glass. Theoretical to a large extent, doing deep fundamental research in material technology and statical systems. Later of course only a limited number of ideas really led to the final Quattro glass product while other ideas contributed to the understanding of frontiers still out of reach.

So a first step ahead was made in a purely technical study - resulting in a 1:4 scale mock-up of 9 fully tempered glass panels united by steel pretensioning nodal connectors and stabilized by cables. The steel connectors ensured that the individual glass panels were really compressed together. In this way the system would be able to both carry tensile and compression forces from one panel to the next one. A pretensioning method with cables was foreseen to stabilize the composed glass plane in space, that is perpendicular on the plane of the glass.

A feedback after realization of the mock-up, however, indicated that the price per square metre was about 3 times a maximal realistic one. But an important technical leap forward had been made.

So the target for the next phase was to simplify the system both with respect to the design appearance as well as to costing. The target being that the final product cost should not exceed that of a medium priced market curtain wall system by more than 20-30%.

This forced technological and costing modesty, compared with the well-known High Tech glamour projects that architects all over the world slaver about may be dictated by the usual Dutch building budgets. It is also due to the presence of many Middle Tech projects (all over the world) with medium sized budgets, compared with the over-publicized High Tech prestigious buildings. The first effect of this
position in the Middle Tech market is that because of the budget restrictions the
design decisions usually fall on simple systems, sober detailing and standard
materials. So a system was developed that is distinctly different from the well-
known structural glass systems as developed by Rice + Francis + Ritchie for the
cité de la technique et du science of La Villette, Paris. The differences between the
RPR connections and the Quattro connection are both in the structural system
(flexible versus rigid), in the form of the node (cross versus H), tolerance
neutralisation (outside versus inside), and material (stainless steel versus
galvanised high yield steel). Yet applications of both systems have been built and
are worth-while comparing.

**Product-architect**

Developing new product systems like the one discussed here means large
investments in Design, Research and Development. With the exception of the large
prestigious buildings that are very scarce in the Netherlands such development
processes cannot be written off in single projects, but rather ask for repetitive
applications, more that none single project architect or architect's office can afford.
Also a succession of similar project applications may not be available within the
oeuvre of a single architect's office. And architects are not used to exchanging
experiences to mutual payment. It is clear that the position of the product architect
as a 'postillon d'amour' between project architects on the one side and producers
on the other side, offers the best potentialities. We think highly of the potentials of
such product-architects in our area where technology complicates the building
process in a way not manageable anymore by the leading project-architect. He is
well advised to have himself assisted by very knowledgeable technical designers
who are able to upgrade the final architectural environment by the best archi-
technological inputs available or imaginable. Successful new products should have
some stunning if not revolutionary aspects, that could be completely absorbed in
the total architecture of the building. The Quattro product system shows as much to
its roots in architecture as it is able to offer to architecture in return.
Quattro glass system, components
Quattro glass system, details
Organogram of a typical development process of products for the building industry in five separate phases
la 2 CV (conçue par l'ingénieur Léonard de chevrotin)
Abandon de la carrosserie caque → un plateau.

bruit de frein
grand ou petit
la pédale de
d'une caravane

Réen n'est plus bruyant
à voir qu'une chaîne
de 2CV en cas de montage.

Renault R8 - Beaucoup plus
voiture bourgeoise
que la 2CV

d'une honnêteté rare!
Theo van Doesburg, the famous De Stijl painter, also had an interest in architecture and stated in 1930: 'In order to have style in architecture, architecture must be technically perfected and every concept of "Art" must, in the context of this development, be placed in the background.'

The last 150 years have been characterised by revolutionary developments in diverse fields. In science and technology, in the arts and in the economy, even in politics. Everyday life is strongly influenced by these developments. New ideas and technologies, however, penetrate slowly into architecture. By making technology central to building it is imaginable that the quality of the built environment will increase. To reach this point research is needed. That is the reason for the theme of this conference: the position of technical research and the training of architectural students - to which an answer will have to be found.

It is time to once again reflect upon the future of architecture. That could well be a pluriform future, not merely technological architecture, neo 'modernism' or new neo-classicism. The problem of architecture is not style but quality, not aesthetics but ethics.

As far as I am concerned, that pluriform future means that a designer should not just become acquainted with developments in architecture itself, but also look over his shoulder at the developments in the other design disciplines. Nor can the influence of history be confined to the history of architecture: the entire structure formed by culture will have to be involved in the architect's considerations.

It would be a sign of stupidity if designers failed to use other or new technologies. Science and technology have a rich potential and a real significance for the
architect. The materialization of ideas about space is still a great challenge. New technologies give designers the tools to create forms with new materials.

Architects should seize upon the political, social and technological changes in our society to develop new architectural structures. Housing, working, eating, shopping, leisure can be integrated. We must try to avoid ghettos and integrate matters in such a way that a lively, 24 hour cycle is created in the city. Favourable economic developments will have to be seized upon to stimulate the development of urban planning and architecture. Urban design and town and country planning must once again occupy an important position. Residents, users and the collectives of buildings and public spaces must form a sort of total organism.

Buildings must no longer be developed as static objects but as dynamic systems. Building can be approached in a much more systematic fashion, for example, by breathing new life into the level theory, so that bearing structures can be detached from partition, finishing and wiring systems. This will increase the flexibility and the mutative capacity of the built environment.

To a certain extent architecture can also be dematerialised. Mass and volume will become lighter and airier. Whereas up to today architecture has been based on hierarchic, linear, orthogonal, static and mechanical arrangement, that will change under the influence of the other production techniques, other materials, microelectronics and biotechnology. Interactions between the climate and the users will be further developed. Control engineering, common in other technical infrastructures, will also make its appearance in the built environment.

At the moment, for purely pragmatic reasons, important changes are being introduced in our faculty. The teaching system is being converted into a system of problem-directed learning, with the division between designing, technology and research being spread equally over the studies. A research section of 30% in the study package is something new and promising. At the same time, education is threatening to become so 'objectified' that there is no longer any room for a multiplicity of approaches to architecture. Research is also being reformulated at the moment. In principle, the research is linked to the main subjects (Architecture. Town Planning, Building technology, Management and Running, and Public Housing). For technological building
research, there is a strong movement towards gathering the university research in the Netherlands (the Faculties of Civil Engineering and Architecture of the TU Delft, the Faculty of Architecture of the TU Eindhoven) into a single research college of Architecture, in which the so-called 'wet' and 'dry' building are brought together. However, there is a risk that this research college will concentrate on purely technical research, comparable to research at the most important extra-university research centres, such as the TNO for example. This would eliminate designing research, while in our opinion that should have a place at the university. The technological building research at our faculty has started up this year and includes three clusters.

1. Constructive development
In the research, an attempt is made to determine the consequences of the developments in building and building production for the design of the construction and the relation with the other components and, on the basis of this, to come up with systematic solutions. For relevant aspects, the research can result in the drawing up of guidelines for designing constructions. The environmental effects of various applications of materials (in building, demolition and conversion) are also studied.

2. The membrane of utilities buildings
On the one hand the goal is to determine a proper attunement between building components and installation components in the membrane area with regard to size and position, so that the desired adjustments can be made in an efficient manner. On the other hand, the development and materialization of architectural systems in relation to formulated engineering principles is an objective in this research cluster. The environmental aspects of different applications of material will be checked. Production methods will be studied, also in relation to adaptation possibilities. The possibilities of active and passive application of light and solar energy will also be involved in the research. In the theoretical sense too, a system will be developed with regard to the planning, relation, separation and/or integration of various components.
3. Product development

The attaining of insight in the field of product development, in consumer-oriented production and in the shifting of production of building components from building site to industry. On the production level a multi-material window system will be developed. The study will involve the environmental effects of the combination of material and production method. Replacement, recycling and the optimalisation of material applications are the goals of the designing research into multi-material window systems. The researchers of clusters 2 and 3 will build upon the research into the 'building knot'. In this research a systematic approach to size, position and capacity of building components in buildings will be advocated.

This summary of the aims and structure says nothing about the quality of the research and the direction it shall move in. To this end the position of building technology in the entire building process must be fixed.

Building technology cannot exist without the relation with architecture. It is necessary to be constantly aware of this. For the professional field of building technology the relation between design and research is no different than for any other architectural problem. Every realised idea - in the form of a concrete brief, a model or prototype - can be tested; the experiences gained in this way can be incorporated into the next design. For the technician it is not only the formal aspect which is important, but above all the execution and use. It is a question of the cohesion of constructive idea and architectural application.

The constructive idea can be the point of departure for the use of the material, the qualities specific to the material and the working techniques applicable to the material. For many architects, development and remodelling of this constructive idea is a thread running through the work from models, prototypes, tentative realizations, to the crystallized concept. The work of Prouvé is an example of this, because not only does he planned his projects, he himself also carried them out.

Now that architects no longer have direct access to the production and product development, the context in which they research the connection between a constructive idea and the architectural application is subject to mediation. On the one hand, consultants act as mediators; technicians or project developers who in terms of the project aim at direct cooperation with industry. Examples of this are
the Bureaux d'Etudes in France, the work of Rice, Francis, Ritchie, Ove Arup and others in England. On the other hand, the architects retain the possibility of making the materialization problematic, from the viewpoint of architectural application. In fact, those are the roads taken by Perret and Mies van der Rohe, although both of them followed the enticing path of classicism.

With designers like Foster and Piano, it is a different story: they use the access of light and the relationship between skeleton and membrane as themes which are worked out differently in each project. In Piano’s work, the materiality, as an extra layer, lends a pregnant significance and reference to the project. In his work, reference, invention and conventions stands alongside each other, in Foster it is only invention.

The above-mentioned examples are taken from practice. There is hardly any relation, if at all, with a university institute. The question is whether universities can be considered capable of making such pronounced statements about the relation between building technology and architecture. On the other hand, the danger of purely technical research is that this research, useful in itself, leads to predictable results: sound but not appealing. That is why in this context I would like to say something else about two private researchers: Jean Prouvé and Renzo Piano.

In the work of Jean Prouvé, architect-constructor from Lille, design and research would seem to have their origins in two contrasting designs. In the first place, this is the weekend cottage BLPS which he designed together with Beaudoin and Lods in 1935. This prefab steel house was designed for holiday use and consists of detachable elements in a closed system. The design for barracks from 1939 shows another structure. Here the house has been split into a skeleton (of steel on the exterior) and a skin of wooden panels. In both the barracks and the holiday house the seam between the panels is nothing more than a sealing link between panels: the wind stress is absorbed by the corners in the elements (BLPS) or by the external skeleton of the house, limited in size.

The Portique house, with a variable size, and the Guillotine panel - a building package of a skeleton with a membrane - lead to the development into an open system. The skeleton can be linked to other elements and extended within a certain system of dimensions, all this on the basis of a load-bearing beam on a double leg.
(portique). The panel developed has vertical sliding glass and sun shades (Guillotine panel): the wall panels contribute to rigidity and stability and the link between the panels is given a certain constructive height so that the wind stress of the panel is spread through the uprights. With Prouvé, the further development of skeleton and membrane into a prefab dwelling and prefab wall panels cannot be seen as separate from his teamwork with architects and his position as producer.

Renzo Piano and his atelier also devote much attention to research. As an example I could mention a truss from 1965 which he builds himself. What is unusual here is that the trusses are constructed from joined transparent pyramids of fiberglass-reinforced polyester. The tops of the pyramids are linked together into a construction network on top. At the same time a trial set-up has been made of an arch constructed with this frame. In 1985 the IBM pavilion was built on this basis. The arches consist of two three-hinged frames as curved trusses: on the top and bottom a construction mesh of laminated wooden beams, with transparent pyramids of polycarbonate between them. Although Piano does not produce himself, he is intensely involved in the preparation of the production. Using models, proposals are formulated which are then realised in collaboration with the manufacturer. I bear both examples in mind in the organization of research at our Faculty of Architecture, so that the design approach is not separate from the research.

Conclusion
Research must be at the service of improvement of the built environment. To this end we must develop various new technologies, methods and forms. The three architectural archetypes in the habitat: the hut, the cave and the tent are all long gone. Buckminster Fuller put it as follows: 'The answer to the housing problem lies in the way to the moon.' Another characterization is: 'Form follows Future.'
R. Piano, IBM pavillion, elements
The ACSA European School of Architecture Conference was made possible by the financial assistance of:

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The City of Delft
The Government Building Agency (RGD), The Hague
Dutch Architectural Institute (NAI), Rotterdam
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