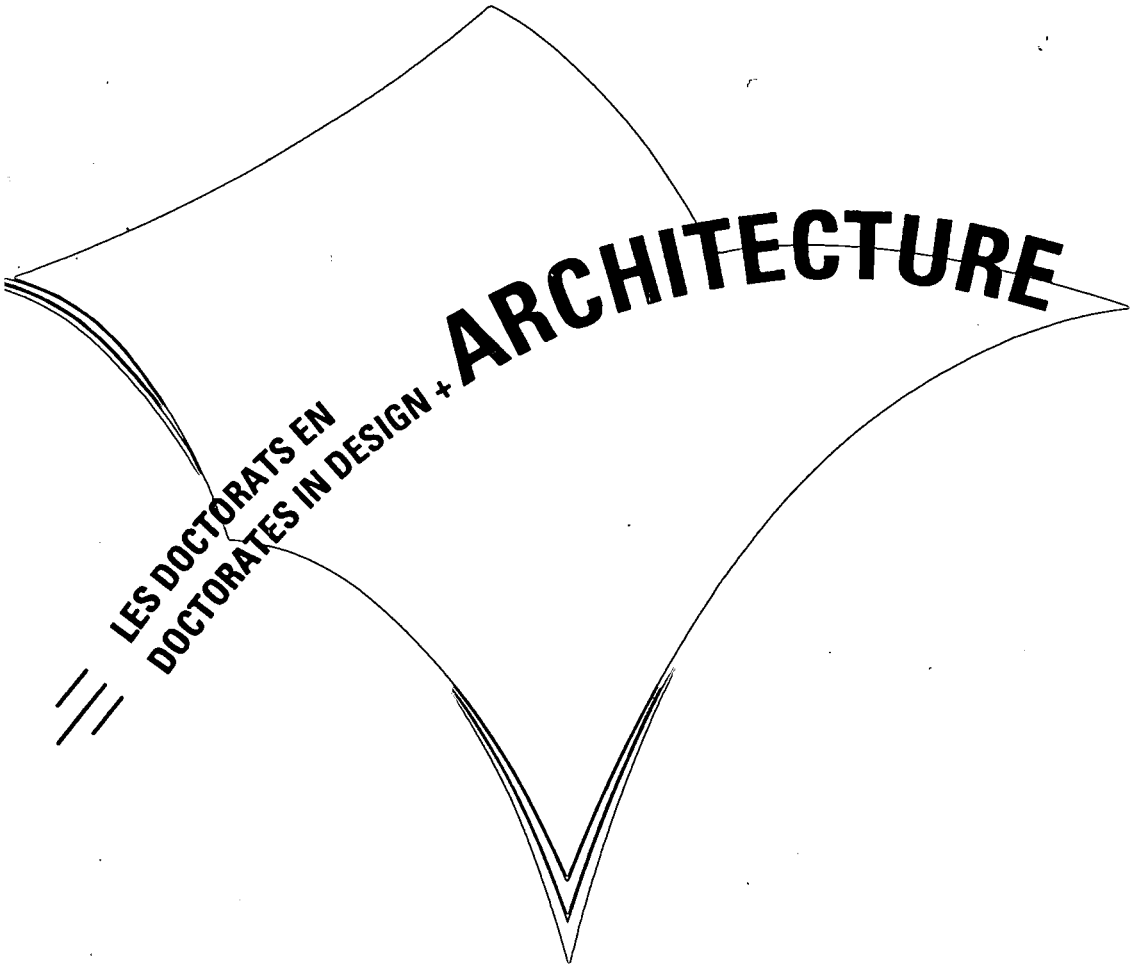

Conference book

DOCTORATES IN DESIGN AND ARCHITECTURE

COLOFON

Published by The Organizing Committee
in cooperation with
Publikatieburo Bouwkunde, Faculty of Architecture, Delft University of Technology,
Berlageweg 1, 2628 CR Delft, the Netherlands, telephone (0)15 2784737
Printed by Universiteitsdrukkerij Delft
CIP-data Koninklijke Bibliotheek, Den Haag
ISBN 90-5269-199-1

EAAE / AEEA - Conference

DOCTORATES IN DESIGN AND ARCHITECTURE
8 - 10 February 1996

Conference book

Delft University of Technology 1996

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Table of contents

IN SEARCH OF A SCIENTIFIC STATUS OF DESIGN RESEARCH

"Where we are now is where Columbus stood and looked to sea"
(John Fowles, The Aristos 33)

Richard Foqué, prof.ir.arch., m. sc.
Conference chairman

We stand in the hinge-point of the turn of the century. History learns us that it is a time of great intellectual conflict. At the same time it is a period of retrospect and a period of transition, where nothing is certain, where new ideas get born, where the foundations are layed for a new society to come. Our profession can not deny this. On the contrary, by the very essence of its nature, we are important protagonists in this process of looking out for the new era.
Uncertainty, controversiality and the falling away of a clear value system are the symptoms of this dying century. At the same time it is an era of self-expression and individual life-style, where the difference between beauty and ugliness fades away, where the visual culture pushes away the verbal culture; where the packing prevails the content.
"Gutenberg is dying. The medium becomes the message", as Mc Luhan predicted it already in the sixties.

We have to conclude that our society very often assesses the quality of an architectural design rather on its publicity value than on its underlying intellectual and philosophical values.
The glitter of the scenery has to cover the miserableness of the content of the piece. We are loosing in architectural design the feeling for the measure of things. We are threatened to loose the three fundamental pilars, on which the design practice relies on since the origin of mankind: "simplicitas, claritas, venustas": simplicity, clarity, stability.
Only because of this, design-results can exceed fashion and time and get a status of universal appraisal and value.
Because of this, form and function become an integrated whole on the real measure of man. Design which serves and not shows.

At the same time worldwide social and technological changes take place. Science proceeds at an exponential speed never seen before. The fully computerized society is in the making. Information technology shakes the truly fundamentals of our present society.
Within this context it should be clear that the designer is confronted with problems of almost chaotic complexity, hard to handle. The design activity not only requires a growing technical know-how, but also an awareness of the social, economical and ecological implications involved.
This growing complexity of design products and processes together with the availability of increasingly larger data files call for considerable improvements on product modelling and testing in the conceptual stage on the one hand and on design methods and tools on the other hand. It involves the development of a design strategical thinking, which lookes at the design process as a whole. We have to recognize that the traditional educational frameworks do not satisfy anymore, as the problems are usually situated in the no man's land between the disciplines.

Within this context the role of design research is vital and crucial at the same time. It should offer us the keys to a wider understanding of how design products come into being, on the effects they are causing on their environment and the ways in which they are used by the consumer. It should give us a broadening insight in how designers think, in the methods they are using and their underlying paradigms. Finally it poses the important question of the scientific status of design research itself and so doing will offer the necessary knowledge for establishing a design theory.

International co-operation between universities and other design institutes, combinations of research programmes; stimulation of interdisciplinary work is an important condition for actual design research.

Therefore this conference on 'Doctorates in Design and Architecture'.
It is the first of its kind and its goals are many and ambitious.
We aim not only at an international comparison of doctorate studies in general, but also at an overview of the current state of the art and an exploration of possibilities for co-operation and organization.
At the same time we should explore areas of utilisation of the results of design research, its effects on design knowledge and the possibilities for job opportunities for those, who obtained a doctors degree in design.

We should try to start to establish a tradition of doctorate studies in the field of design research, looking for new opportunities.
It should be clear indeed that there is little tradition at the several universities throughout the world with research in architectural design, as the first PhD degrees in architectural design were obtained at the end of the sixties. Even today, after almost 30 years, not many architects or designers in general have interest in a doctoral promotion or even research.
The field of architectural research is widespread, differentiated and often specialised.
Therefore the conference is clustered around 3 main themes.

1. Research in the Design Process itself, including 3 main topics:

1.1 Generating Design Concepts

The amount of "relevant information" the designer is nowadays confronted with, is enormous. In a few years time the information highways will enlarge this data-scope to gigantic and unrestrained proportions.
Questions to be answered here may be such as:
Are there new methods of controlling these data explosions? How to choose between relevant and irrelevant information? Is it important to make a distinction between quantifiable and non-quantifiable parameters? How to introduce both these parameters in a useful way in the design process? Do universal data selection criteria in design processes exist? Shall we aim for and develop specific design languages to facilitate the data communication during the design process? What is the role of "heuristics" in manipulating the vast amount of design information?

Designers are using various kinds of strategies and methods to transform abstract data into concrete forms and solutions.
All design problems have to do with the creation of objects or spaces, which have both a practical purpose and an esthetical component.
Design solutions are intended "to work" functionally but are also intended at the same time to be looked at and arouse feelings of well-being and beauty.
How does the designer think? Are there individual styles or common strategies to generate design concepts? What is the role of conceptional thinking versus normative, interpretative or descriptive approaches? What is the role of the electronic media in this part of the design process? What is the role of artificial intelligence? Is there a future for a fully automated process? What are the tactics and traps and how to cope with these?

1.2 Materialisations and Productions of the Design Output

The ultimate aim of a design process will still be the transformation of a "software" model to a "hardware" reality. There is a growing relationship between the research in new materials, the production of standard building parts and their relevance to good and affordable design but also the maintenance cost and ecological feasibility. Among designers the impact of these aspects is often neglected or settled as irrelevant. Insight in good technical detailing and in appropriate materials selection is essential not only for the design output in a functional way but also with respect to its visual appearance and "esthetical value". How can CAD/CAM procedures contribute to new ideas into this less researched area?
Which will be the influence of new materials on design concepts? Is standardization influencing the notion of "good" form? To which extent are maintenance and ecology parameters for testing design hypotheses?

1.3 Design Methodology

The output of a design process can be described in terms of design hypotheses, which have to be tested and proved "false" or "true".
The use of models in this stage of the design process is essential and vital. Both methods of functional and visual analysis should be developped in order to test the design product already during the conceptual phase. Testing "in computro" will become indispensible. Cyberspace and virtual reality techniques will become the key to "good" modelling and design output assessment.
What is the state of the art at this moment? Where are we going to? What will be the role of the designers in this process, what is the role of the machine? How can we analyse and assess design outputs in virtual reality environments? Can every aspect of a design be modelled? Will there be a distinction between medium and message, between process and product or will it be two facets of one reality?

Methods, strategies and procedures are greatly influencing the results which they are producing. The study of these effects belong to the field of design methodology. How can we assess design processes? Is one design method more appropriate than another given a particular set of circumstances? How can we evaluate design methods? Does computer aided design methods produce a different kind of output than the traditional ones? Do universal design procedures exist or is designing still a very individual activity based on very personal techniques?

2. Research in Architecture as an own Discipline

Where the previous studies rather the process, here we investigate the output, the product of the architectural design. It covers not only questions on the level of the building but also on the level of the city. It deals with traditional questions of form and function of space and rythm, of beauty and ugliness, of order and compositions, but also with new items of knowledge and action, of user participation, of understanding behaviour in a build environment. It is per excellence an interdisciplinary activity, building up its own logic and epistemological autonomy.

3. The current State of the Art and Organization of Doctoral Research in Architectural Design

The way in which doctoral research in design is organized throughout the universities and faculties in europe and the USA varies a great deal. Are there longterm doctoral research programmes? How is the research financed in different countries? How are candidates selected?
Which are the criteria for selection? How is the supervision organized?
Is exchange of doctoral students among different faculties/universities possible? How can we create new doctoral study-programmes in architecture in the européan countries?

During the morning plenary sessions we will debate on this state of the art in the different countries. Differences and analogies may become clear and may give us a better understanding of the way in which doctorate research is organized in the western hemisfere and help us to improve both the quality and the quantity of design scholars.
The three other themes are dealt with in parallel sessions. We believe that the advantage of a smaller group will stimulate an extensive discussion on the several themes on the basis of the selected papers.
During the closing session concluding reflections will be made on the basis of a round tabel discussion.

This conference is the first of its kind. Its importance is therefore enormous. We are privileged that we can attend. Let us hope that it may be the start of the definite recognition by the academic world of the scientific status of research in design and architecture.
On behalf of the organizing committee I wish you a creative, stimulating and intensive conference.

Overview of the programme

Wednesday 7 February 1996

18.00 -20.00: Registration and drinks.

Thursday 8 February 1996

08.00 - 09.00	Registration.
09.00 - 09.30	Welcome and introduction.
09.30 - 10.30	Key-note speaker **Francis Duffy**: 'The way forward'.
10.30 - 11.00	*Coffee and tea.*
11.00 - 12.30	Plenary session on the State of the Art: **A. Tzonis - J. Powell - H. Höfler - J.L. Cohen.**
12.30 - 14.00	*Lunch.*
14.00 - 15.30	Parallel sessions: 1A: State of the Art. 1B: Materialisation and production of design. 1C: Research in architecture and other disciplines.
15.30 - 16.00	*Coffee and tea.*
16.00 - 17.00	Parallel sessions: 2A: State of the Art. 2B: Generating design concepts. 2C: Research in architecture and other disciplines.
17.00 - 18.00	Opening Archiprix- exhibition.
18.00 - 20.00	*Drinks and buffet.*
20.00 - 21.30	Lecture architect.

Friday 9 February 1996

09.00 - 10.30	Plenary session on the State of the Art: **P. Lombaerde - P. Von Meiss -** **J. Lundequist - R. Schneider.**
10.30 - 11.00	*Coffee and tea.*
11.00 - 12.30	Parallel sessions: 3A: Design theory and methodology. 3B: Generating design concepts. 3C: Education in research and design.
12.30 - 14.00	*Lunch.*
14.00 - 15.30	Parallel sessions: 4A: Design theory and methodology. 4B: Urban design and architecture. 4C: Analysis of oeuvres. 4D: Sustainability.
15.30 - 16.00	*Coffee and tea.*
16.00 - 17.30	Round table discussion and conclusions.
17.30 - 18.30	*Drinks.*
18.30 - 20.00	General assembly EAAE / AEEA.

Saturday 10 February 1996

14.30 - 17.00	Excursion Netherlands Architecture Institute (NAI) and Museumpark in Rotterdam.

Detailed programme

Wednesday 7 February 1996

Room	Time	Activity
Reg.	18.00 - 20.00	Opening-reception / Registration.

Thursday 8 February 1996

Reg.	08.00 - 09.00	Registration.
A	09.00 - 09.15	Welcome to the EAAE / AEEA conference 'Doctorates in Design and Architecture' by the Dean of the Faculty: **C Dam**
A	09.15 - 09.30	Introduction by the chairman of the conference: R. Foqué.
A	09.30 - 10.30	Key-note speaker **F. Duffy**: 'The way forward'.
Landing	10.30 - 11.00	Coffee and tea.
A	11.00 - 12.30	PLENARY SESSION on the State of the Art - part one (Chair: **D. Frieling**). **A. Tzonis** (the Netherlands) - **J. Powell** United Kingdom) - **H. Höfler** (Germany) - **J.L. Cohen** (France)
Conf.r.	12.30 - 14.00	Lunch.
		PARALLEL SESSIONS
12.15	14.00 - 15.30	STATE OF THE ART (Chair: **S. Chardonnet**). **T. Arrhenius** (Stockholm) The Construction of a New 'Ism' - the Rhetorical Context of Architecture.

Room	Time	Activity
		G. Sweitzer (Tokyo) Architectural Research in Japan: Content and Organisation. **E. Lengereau** (Paris) Formation doctorale et recherche architecturale en France.
12.07	14.00 - 15.30	MATERIALISATION AND PRODUCTION OF DESIGN (Chair: **J. Brouwer**). **S. Emmitt** (Northampton) Developing a View on the Communication of Building Product Innovations to Architects. **M. Oostra** (Delft) How Buildings Can be Tailor-Made. **C. Ostorero** (Coazze) House of the Mechanical Muses. **V. Thöne** (Delft) Junctions between Components.
10.07	14.00 - 15.30	RESEARCH IN ARCHITECTURE AND OTHER DISCIPLINES (Chair: **C. ó Catháin**). **E.S. Brierley** (Leicester) The Boundaries of Architectural Research. **H. Heynen** (Leuven) Research in Architectural and the different Disciplines. **G. Matthews** (Humberside) Doctorates in Design? Why we need a research culture in design. **R. Swanson** (North Carolina) Confronting the Barrier between Qualitative and Quantitative Research.
Landing	15.30 - 16.00	Coffee and tea.

Room	Time	Activity
12.15	16.00 - 17.00	STATE OF THE ART (Chair: **L. van Duin**). **H. Dunin-Woyseth** (Oslo) Architecture: a Profession or/and a Discipline? On Doctoral Program of the Oslo School of Architecture. **M. Kubelík** (Wenen) The Specific Role of the Doctorate in the History of Architecture Within an Architecture School. **E. Murray Milne** (Los Angeles) Proposal for a National Academy of Architectural Science.
12.07	16.00 -17.00	GENERATING DESIGN CONCEPTS (Chair: **H. van Wegen**). **P. Deshayes** (Paris) Méthodologies de la conception et connaissance de la conception. **Y. Gijsbers & P. Hekkert** (Delft) Design Thought and Design Process; Making vision visible. **W. Korbel** (Krakow) Modern Ways of Urban Space Refurbishment
10.01	16.00 - 17.00	RESEARCH IN ARCHITECTURE AND OTHER DISCIPLINES (Chair: **T. van der Voordt**). **T. Pakarinen** (Tampere) Art Theory and Cultural Studies as a Bridge Between Architectural and Urban Research. **D. Yeomans** (Manchester) Can Design be called Research? **J.L. Capron** (Brussel) Modalités d'une recherche sur la perception de l'environnement construit.
Exhib.	17.00 - 18.00	Opening Archiprix- exhibition.
Conf.r.	18.00 - 20.00	Drinks and buffet.
A	20.00 - 21.30	Lecture.

Friday 9 February 1996

Room	Time	Activity
A	09.00 - 10.30	PLENARY SESSION on the State of the Art - part two (Chair: **N.O. Lund**). **P. Lombaerde** (Belgium) - **P. Von Meiss** (Switserland) **J. Lundequist** (Sweden) - **R.H. Schneider** (USA)
Landing	10.30 - 11.00	Coffee and tea.
		PARALLEL SESSIONS
12.15	11.00 - 12.30	DESIGN THEORY AND METHODOLOGY (Chair: **R. Foqué**). **A. Asanowicz** (Bialystok) The New Output in Traditional Design Methods. **G. Barbey & M. Clivaz** (Lausanne) Towards a Methodology for the Safeguard of Existing Buildings. **M. Bobic** (Amsterdam) Studies in Morphology of Place. **J.L. Heintz** (Delft) A Virtual Office Support System for Concurrent Design in Architecture.
12.07	11.00 - 12.30	GENERATING DESIGN CONCEPTS (Chair: **H. van Hoogdalem**). **K. Grillner** (Stockholm) Theory and Practice of Artistic Creation in the Early 17th Century: The Poetic Model of Salomon de Caus. **A. Luescher** (USA) Visual communication in Architectural Design. **P. van Wesemael** (Amsterdam) Architecture of Instruction and Pleasure.
10.07	11.00 - 12.30	EDUCATION IN RESEARCH AND DESIGN (Chair: **G. Barbey**) **F. Radu** (Bucarest) Research in Teaching Architectural Design - Between Empiricism and Science.

Room	Time	Activity
		N. Marda (Greenwich) Architectural Education and Reality. **P. Boudon** (Paris) De l'influence de l'idée de technique sur l'enseignement de l'architecture. **E. Cardoso, A. Del & C. Nidriche,** (Paris) Savoir & action: les 'nouveaus outils' sont-ils 'urbainement corrects' pour les relations enseignement/recherche?
Conf.r.	12.30 - 14.00	Lunch.
		PARALLEL SESSIONS
12.15	14.00 - 15.30	DESIGN THEORY AND METHODOLOGY (Chair: **H. Neuckermans**). **E. Downing & R. Warden** (Texas) Method Without Theory is Empty, Theory Without Philosophy is Blind. **B. Leupen** (Delft) Architectural framework. **P. Hekkert** (Delft) The Designer as a 'Hox-gene': The origin and impact of vision in the evolution of design. **N. Teymur** (Ankara) Epistemological Maximalism vs. Professional Minimalism.
12.07	14.00 - 15.30	URBAN DESIGN AND ARCHITECTURE (Chair: **C. Spiridonidis**). **M. Glaudemans** (Eindhoven) Territory city: Congestion and Dilution of the 'Full Country'. **S. Prahl** (Berlin) Public Urban Open Space in North American city centers. **C. Stegewerns** (Delft) Designing Living Rivers in an Urbanizing Landscape.

Room	Time	Activity
		J. Meeus (Eindhoven) Designing Greenstructures and the Development of Nature in Dutch Cities.
10.07	14.00 - 15.30	ANALYSIS OF OEVRES (Chair: **C. Weeber**). **M. van Stralen** (Eindhoven) The Work of the Dutch Architect H. Th. Wijdeveld (1885-1987). **L. Molinari** (Milaan) ' Continuità' and crises; The Theoretical and Design Approach of Ernesto Nathan Rogers in the Architectural Post-war Debate. **A. Schultz** (Stuttgart) The Process of Stratification in the Work of Carlo Scarpa. **S. Ren-Liou & E. Vakaló** (Michigan) Speculations on the Morphology of the Plans of Seven Ando Houses.
06.07	14.00 - 15.30	SUSTAINABILITY (Chair: **H. de Jonge**). **C. Ravesloot** (Delft) Research in Technical, Economical and Cultural Effects of Sustainable Building. **R. Navarro** (Canada) User-Oriented Assessment of Innovations in Low-Cost Housing. **A. Guimarães** (Delft) Integration of Energy Saving Systems in Historic Buildings, interaction with the Renovation Process of Buildings. **B. Kuc-Sluszeniak** (Gliwice) Presentation of Problems from Heavy Polluted Industrial Areas in Poland Facing the Growing Needs of Conservation.
Landing	15.30 - 16.00	Coffee and tea.

Room	Time	Activity
A	16.00 - 17.30	ROUND TABLE DISCUSSIONS AND CONCLUSIONS (Chair: **A. Tzonis**).
Conf.r.	17.30 - 18.30	Drinks.
A	18.30 - 20.00	General assembly EAAE / AEEA.

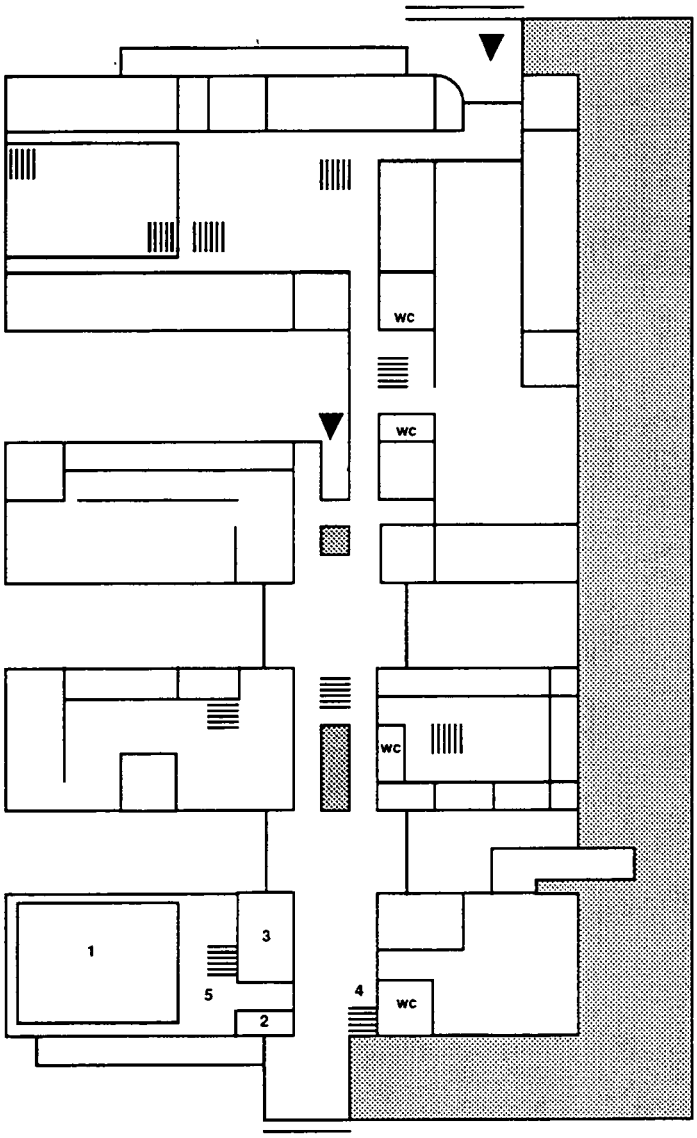
Saturday 10 February 1996

Rotterdam

14.30 - 17.00 Excursion Netherlands Architecture Instituut (NAI) and Museumpark in Rotterdam

address: Museumpark 25, 3015 CD, Rotterdam
tel: (31) 010-4401200

Ground Floor



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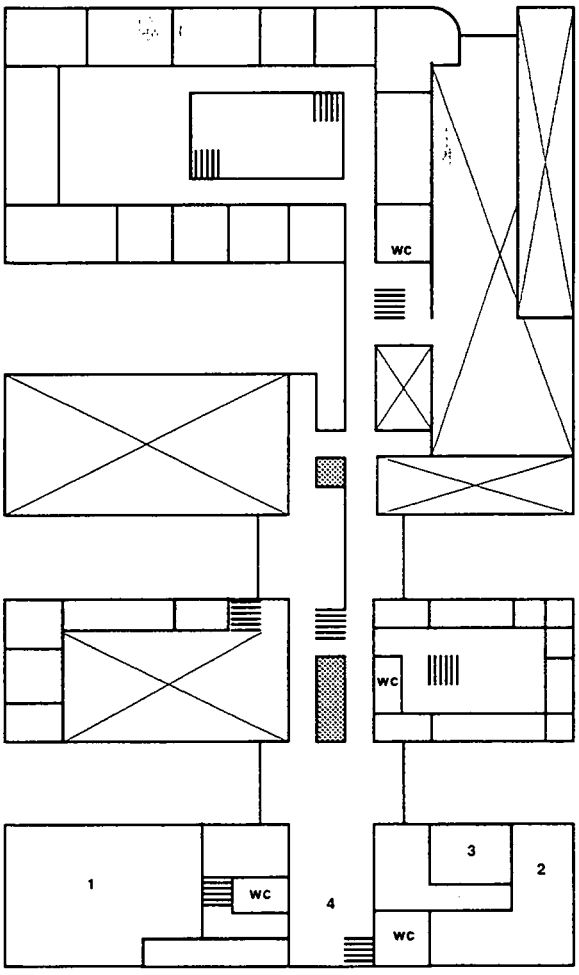

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2 Main conference room
3 Small conference room
4 Landing

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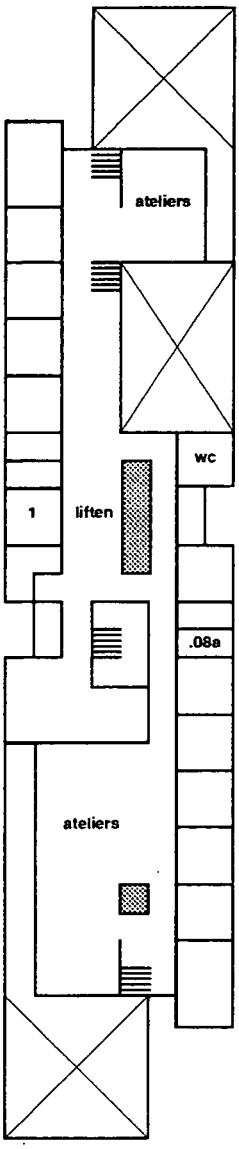

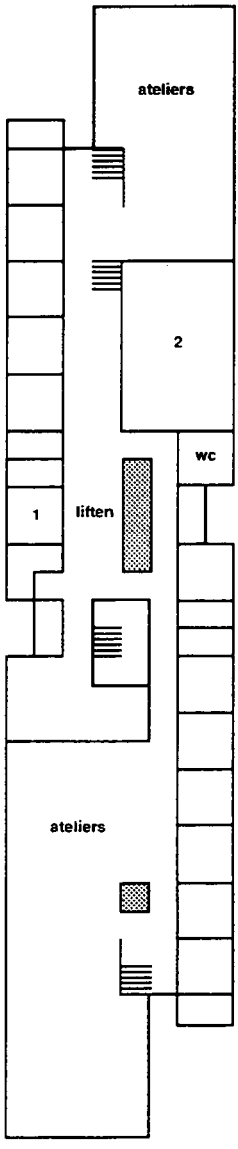

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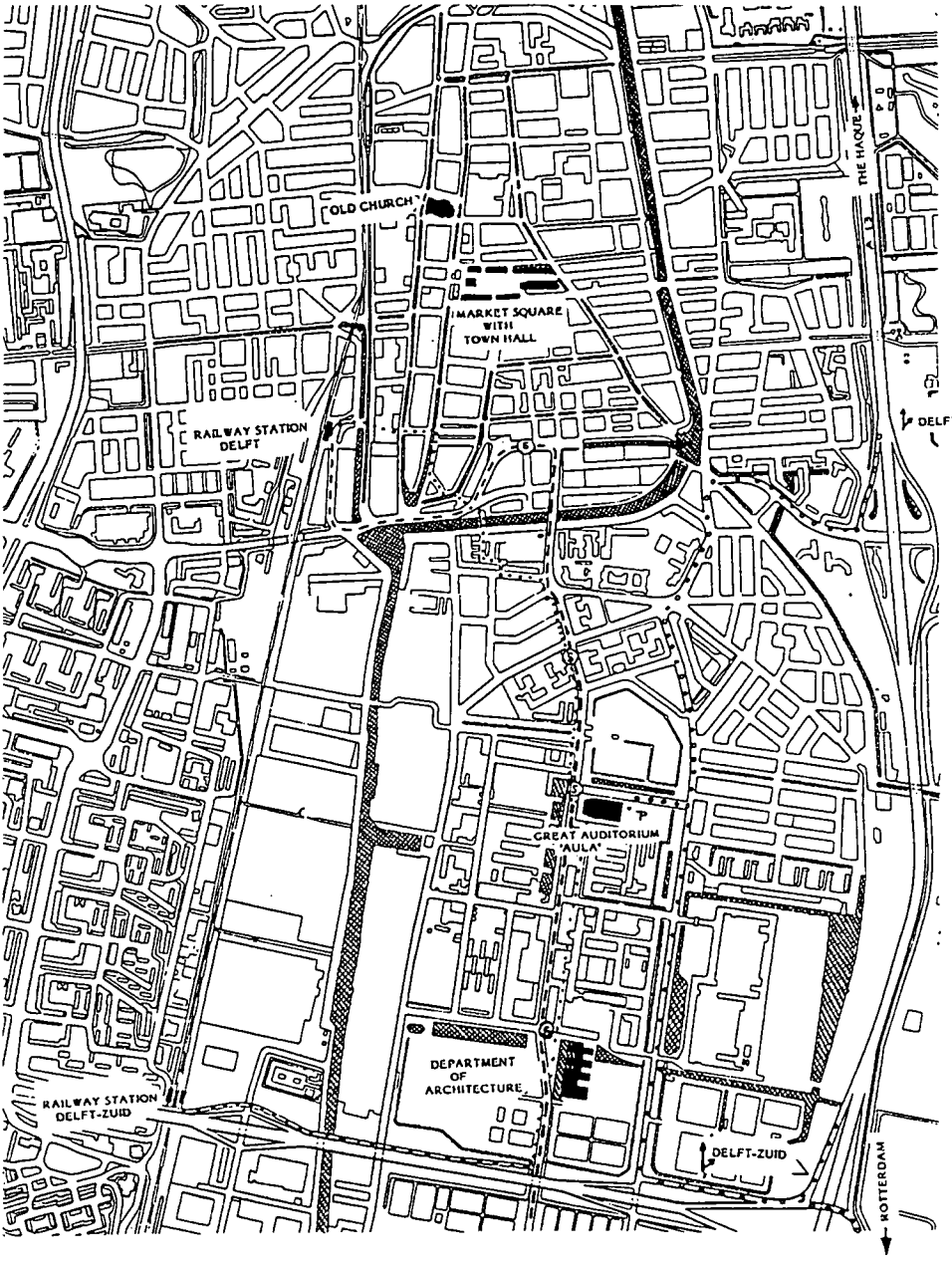
2 Parallel sessions room 12.15



Plan of Delft

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CARTESIAN DUALITY AND CONCEPTUAL THINKING

Johann Albrecht, Ph.D., Professor of Architecture
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As early as the late thirties, Karl Mannheim warned of the phenomenon of a disproportionate development of human faculties. His warning is based on the observation that the more a society is advanced, the greater the compulsion to rely on scientific achievements and act in a functional and instrumental manner. In such a society the organizing and technical elements would predominate, while reflective, artistic and moral elements would be very ineffective. That is to say, there is the likelihood of the total dominance of technical rationality.

One could argue that processes set in motion by the enlightenment have finally reached their full potential and that the dualisms generated by a Cartesian world view (thinking vs. feeling, objective analysis vs. subjective insight, appearance vs. essence, etc.) have deepened further. For example, the dualism between humans and their objects, caused by the Cartesian separatism of mind and matter, has now led to the estrangement of humans from their environment with the consequence that the latter has become increasingly meaningless and devoid of significance. And one could say that the manner in which the enlightenment defined cognition prepared the way for the current neglect of the mythical and poetic dimensions of life and the widespread opinion that these dimensions cannot be incorporated in our concepts of knowledge.

While the loss of meaning in architecture has received widespread attention during the last few decades, the underlying and concurrent problem of Cartesian duality in architectural education and in particular, its negative consequences on conceptual thinking has hardly been recognized.

The disproportionate development of human faculties and the current situation in architectural education become more understandable when we look at the latest findings in mind research and human psychology. The

human brain consists of two halves which are linked at the center of the cerebral cavity. Generally speaking, each side of our brain functions differently than the other side, each perceives reality in its own way. In other words, both parts of our brain perform cognitive operations, but each part is trained for different modes of thinking. The perception of the left side of our brain works in such a way that sensory input is organized as points on a line. Language, the linear flow of words, and time are thus functions of the left hemisphere. Causality, nothing else than the image that the preceding event causes the following, is a creation of the left brain, whose successive ordering accounts for its logical and rational nature. The right brain appears to synthesize things into organized wholes and patterns, that is, it is specialized for Gestalt and space perception. It is also that part which is responsible for intuitive and imaginative processes. The right hemisphere produces knowledge through intuitive understanding, the left hemisphere through inferential logic. Current research shows that despite our belief that we are one person, we use two minds and possess two kinds of consciousness. For the most part, the two hemispheres work together in a cooperative manner, each performs those tasks which relate to its mode of information processing. Yet there are times when only one brain operates and even moments when both are at conflict.

In ideal circumstances, architectural education is unique because it demands the full activation of the two sides of the brain. On the one hand, there are courses that are rational, analytic, and abstract in nature, their material organized and presented in sequential order, on the other, there are courses that ask for intuition and imagination, that work with visual analogy and the objective of synthesis, and that state their problems in a holistic manner. Needless to say, true creative activity is a process that integrates both functions of the brain. One could argue that the proper use of the right hemisphere in architectural education could serve as a remedy for previous half-brained education and modify the disproportionate development of human faculties, at least in the realm of architecture.

THE CONSTRUCTION OF A NEW "ISM" -THE RHETORICAL CONTEXT OF ARCHITECTURE

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By looking closer at the creation of Deconstructivism, an architectural 'ism' that established itself on the architectural scene towards the end of the 1980's, the paper discuss some of the different desires and rhetoric that may underlay the contemporaty tendency for architects to establish working relations with philosophy. The introduction of the term "Deconstructivist" into architectural parlance can be traced back to the exhibition Deconstructivist Architecture held at the Museum of Modern Art in NewYork 1988. The paper therefore returns to the material presented in the exhibition. Focusing on the text Deconstructivist Architecture by Mark Wigley in the exhibition catalogue, the paper begins with a brief discussion on the relationship between the philosophical term 'deconstruction'and the architectural term 'Deconstructivist' in order to reveal the underlying rhetoric behind the concept 'Deconstructivist Architecture'. This rhetoric is discussed further by investigating the exhibition's references to the avant-garde of Russian Constructivism and by considering the political connotations of architectural form. Continuing, the paper claims in opposition to the curators of Deconstructivist Architecture that the architecture of the exhibition gained its critical edge specifically through discourse, and concludes by arguing for the necessity of a rhetoric in contemporary architectural practice.

Conclusion

The creation of the new 'ism' of the eighties-Deconstructivism- is a clear, but also curious, example of how and when an architectural rhetoric has been used to create a new foundation for architecture. The MoMA exhibition, followed by several publications on Deconstruction in the architectural press, established Deconstructivsm as a new architectural concept on the American and European architectural scene in the late 80's.

The catalogue for the exhibition shows how theory can be used as a tool to communicate and to inscribe certain interpretations on a group of

architectural projects. A rhetoric was created that, even though inspired by Derrida and Post-structural thought, constructed rather than deconstructed an origin, a meaning and a centre for a group of diverse architects' work. Even if the curators themselves rejected the rhetorical use of theory- "Indeed the force of the objects makes the theory that produce it irrelevant" (Johnson, Wigley, 1988)- the paper argues that the built form of Deconstructivism gained its critical edge because of the drawings, lectures and writings about it. In opposition to Wigley who suggests that the force of the form of Deconstructivist Architecture makes the theory that produces it irrelevant, this paper has explored how a skilful production of an architectural rhetoric surrounding the MoMA exhibition created itself the political force Deconstructivist Architecture aspired to.

THE NEW OUTPUT OF TRADITIONAL DESIGN METHODS

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Designing is a creative action aiming at solving the problem. It includes various activities. It is connected with the question arised: (How does the designer think and what is the result of this process?(Contemporary designer thinks in the same way his predecessor from the 15th century did. He chooses, evaluates and chooses again. Usually designing was considered as a linear process, with one stage after the other. Contrary to the opinions existing in the theory of designing, it is not a linear process. Different means are used in creation process. As we deal with 3-D imaging, we need some graphic means of presentation to show the full potential of this process. In a traditional designing process both drawings (2 and 3-D) and models are used to present the space. Static is their characteristic feature. This stands in opposition with the dynamic character of the designing activities. That is why the architects have been looking for means allowing to change the way of presentation of architectural form.

Computers have changed the production of presentation drawings in architectural offices, but they have not had much impact on architectural design. As we can see there is no difference between the old and new way of designing. Suggestion made by the software companies is limited only to the replacement of a pencil, drawing pen and a brush with a computer mouse and programmes imitating (emulating) the pencil, drawing pen and the brush. It is not enough to talk about the changes in the designing process. We can only talk about the changes of tools in designing, and not the changes in the methodology of designing. But in my opinion there is no doubt that computers in general, and CAAD in particular, will change the practice of architecture. What is its cause? It seems that one should not look for its cause in the discrepancies between the designing tools and the designing process, but rather in the inadequacy of the theory of designing to designing as such. Designer's thinking is characterised by simultaneous consideration of many contrary opinion. Designing is not a PROCESS. It is an ACTION in which the sequence of particular functional components is of no crucial

importance. The statement above explains, why we are not satisfied with the introduction of computer techniques in designing. New media demand new process, and the new process demands new media. The cyberspace gives us a new chance. Cyberspace is a graphic representation of data abstracted from the banks of every computer in the human system. In fact, the many dimensions of meaning and (existence(in cyberspace have led to a cyberreal architecture that is sure to have dramatic consequences for the profession Although cyberspace will never replace traditional architectural work, the electronic realm opens huge territory for architectural expertise at a time when conventional career paths are hard to find.

MY OWN EXPERIENCE IN DOCTORAL RESEARCH

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The first question to be answered is:

"Is it possible to write Ph.D. theses in the field of architecture?"

Lack of univocal answer affects the present situation in this field in Poland. Large number of elder architects who work in the Faculty of Architecture opposes treating architecture as science (not as art). The necessary steps to begin the Ph.D. procedure are:

1. to find a theme of the work
2. to find a professor who would be responsible for the work
3. to get the Faculty Council's approval to open the doctoral research.

All the steps mentioned must be taken by the archtitect personally. There are no postgraduate studies in architecture in Poland. The only form of help given are doctoral seminars. They are organised by different scientific institutes. They last from half a year to two years and they aim at giving some methodological support to persons who intend to start scientific research. I took part in such a seminar for 4 semesters in 1992 - 1994, organised by Institute of Physical Planning and Municipal Economy. It helped me to extend my knowledge and to form the subject of my Ph.D. thesis. Thus one may assume that the first stage of the process has been already fulfilled. I managed also to complete stage two (find the professor responsible) and parially stage three (by publication of some papers concerning modernisation of housing environment). In the nearest future I hope to open my doctoral research. This is my answer to the question: "Is it possible to write Ph.D. theses in the field of architecture?".

All the issuse addressed above were linked to the formal aspects of for undertaking writing of a doctor's thesis. But the question how it shoud be done properly is still remained. How to write a doctor's thesis, where to start from and what shoud it be it's structure?

Stage 1. Precise description of the thesis and title reflecting essence of the problem which is about to be researched upon in it. "Remodelling of modernisitic housing areas."

Stage 2. Explanation of a problem or a reason which directly contributed or caused undertaking to write the thesis.

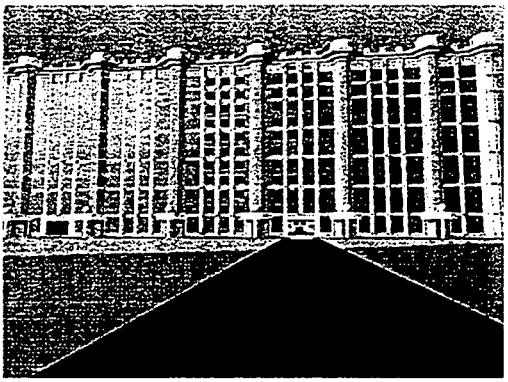
"Modernistic housing areas developed during few last decades have been criticised mainly for its forming of space and creating of an environment, its incompatibility to an aesthetic expecation and needs of its inhabitants."

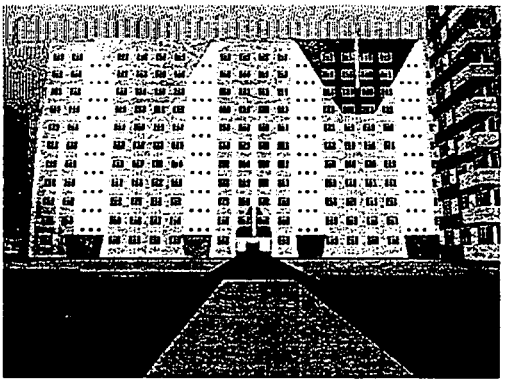
Stage 3. Desciption of the thesis.
"The material value of these modernistic housing areas determines its transformation and remodelling for the purpose of achieving the function and form variety."

Stage 4. Analysis of transformation and remodelling attempts being undertaken in Europe.

Stage 5. Description of actions shoud be undertaken to produce optimal results and describing a methods for revitalising of one of those housing areas.

Stage 6. Defending of the thesis.





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TOWARD A METHODOLOGY FOR THE SAFEGUARD OF EXISTING BUILDINGS

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It is now evident that a major part of the built environment will have to be readapted, refurbished or reconverted in the future, in order to become more sustainable. Useless or underused buildings tend to wear out much faster than used ones. It was suggested that the built environment should parallely be investigated in terms of its material condition, built type, use and human occupancy, and experiential impact. However, a precise methodology designed to perform such a difficult synthesis of various dissimilar values is still lacking, although several attempts at establishing such a method of study were already made.

This paper is a critical presentation of a pilot program for a doctoral thesis concerning the detailed investigation or diagnosis of downgraded buildings (see following sheet). Its basic intention is to extend and enhance the usual case study approach, in order to integrate various theoretical considerations and reach an adequate level of generality. On the basis of previous experiences in the field of conservation and restoration of buildings, a tentative list of contents related to the topic of the doctoral thesis is based on the two following headlines:

A. The Preservational Design Process
B. A Revised Methodological Approach

Following a perspective derived from the philosophy of sciences, the study is based on the integration of epistemological and methodological concepts providing a thorough data base concerning the building or environmental component under study.

This resulthing diagnostic is expected to facilitate a forecast or prognosis of the future condition of the building, which is equivalent to a precise program, including performances and specific requirements.

The proposed study method should be further matched against practical achievements, in order to check its degree of validity. A step-by-step method will presumably help moderate the extent of change and cost the upgrading of the building, thereby conforming to the traditional recommendation of art history (conservation rather than restoration).

STUDIES IN MORPHOLOGY OF PLACE

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The concern of this paper is the possible approach to the study in morphology of place. It is based on the author's book *The Role of Time Function in City Spatial Structures* (Bobic, 1990), and on his practice on University of Belgrade

The paper does three things. First, it discusses contemporary opposed doctrines in studies of architectural morphology: phenomenological and quantitative. The ideal of architecture, both in history as well as today, has been that of building places. Place is at the very core of existential space. Besides this there is a long tradition in morphological studies where no common doctrine or methodology exists. As a consequence, the discovery of the full sense of place is still missing. A morphological understanding of place, from a stand point between these two approaches seems more appropriate.

Second, it pleads for the broadened scope in morphological analyses, that leads to the discovery of the place genetic code - a complex system of tangible and intangible aspects, patterns of form and patterns of living. For that reason, when considering morphological studies of architectural space, two points should be included:

a) *typological* and b) *contextual*.

There are also two reasons incorporated in architectural discipline itself. At first, place is a bipolar system arranged between a particular domain and the carrier, expressed through architectural form, and at second, architecture is not a strict scientific discipline but more an experimental laboratory.

Methodologically there is a problem with morphology - what is constructed - and a problem with morphogenesis - how is it and why is it is constructed. Knowledge of the first is proportional to the number of depicted records, and usually large, but a knowledge of the second is not only the

matter of architecture. This requires that studies in morphology of place should virtually imply the synthesis of bordering sciences with less paradigmatic tradition.

The connection of different ideas and parameters into a logical whole may create the skeleton for a morphological analysis of built place. A general knowledge of history and wider context, other situations in the same time-cut, or analogical global examples, dimension-less and regardless of the time of creation, in short: cognitive schemata, personal experience and spatio-temporal reality of a place, all in three different scopes: global, regional and local, form the library of data or references about reality, which make a framework which generates a more applicable result.

Third, this paper introduces space-time analyses as an operational common language for the presentation of intangible aspects of form. An especially difficult task is the discovery of a spatio-temporal reality of place. The morphology based on space-time relation presents reality in a more precise manner than methods of analysis focused on research of the form and genesis of artefacts. When the interrelated categories of space and time unite and complement each other they may present such intangible aspects as: social grouping, spots and paths, contractions of space in daily use, and so on.

Among many, three models of time manifested in space are focused upon as a source for studies in morphology of place:

a. Quantitative or diachronic, which corresponds to Euclidean space.
b. Qualitative, manifested by specific activities in the spatial context .
c. Subjective, or lifetime of the individual conditioned in existential space

This is a comprehensive framework for investigation into the possibilities of analyzing the culture contained in space, as seen through architectural theory and compared to the real nature of process. In other words, by this approach we may discover a reality of place which is slightly different than an architect's theoretical interpretation of spatial form. In turn this may induce lateral thinking as prerequisite for the reconsideration of the existing schemata and archetypes.

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DE L'INFLUENCE DE L'IDÉE DE TECHNIQUE SUR L'ENSEIGNEMENT DE L'ARCHITECTURE

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L'influence des matériaux et de la technique sur l'architecture - ce depuis le concept de soiliditas de Vitruve et quelques autres points historiques marquants qu'on tentera de signaler - constitue un topos des discours sur l'architecture.

Sait on bien, pour autant, ce qu'on entend alors par "technique"?

La connaissance dite technique étant généralement elle-même très "technique", le risque de s'attacher à l'une ou l'autre des dites techniques, lesquelles sont multiples, auxquelles peut avoir affaire l'architecture ne s'accompagne-t-il pas de celui de quitter les rives de l'architecture pour se faire absorber par tel ou tel domaine de connaissance? Comment dès lors penser les rapports entre architecture et technique? Il s'agit là d'un enjeu préalable à la décision d'installer telle ou telle didactique propre à une technique dans l'enseignement de l'architecture.

Pour tenter de poser cette question, - la résoudre paraissant bien trop ambitieux - on s'appuiera d'une part sur les considérations portées jusqu'ici à la technique par l'architecturologie à l'endroit de l'échelle technique, d'autre part sur l'interview d'architecte(s) focalisant sur la question de ce rapport. On concluera par une mise en garde contre le caractère généralement monovalent des figures du discours architectural qui mettent en jeu l'échelle technique (ce terme étant pris en son sens architecturologique) en s'étendant plus généralement sur les difficultés dûes dans d'autres domaines, à la monovalence de la critique architecturale.

THE BOUNDARIES OF ARCHITECTURAL RESEARCH

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Whereas the intellectual field of architecture is amorphous, the practical objects and personalities associated with the discipline provide a rich vein for academic investigation. The features which distinguish architecture from other disciplines have tended to have indistinct boundaries and indeed one of the delights of research associated with architecture has been the way in which research has drawn upon other disciplines. Architecture relies upon a variety of sources of inspiration, knowledge of culture, and properties of building structure and materials. Each study area may claim distinct characteristics of research methodology. Research themes develop a philosophical and contextual framework for the identification of intellectual projects often drawing upon disciplines that impinge on the field of architecture.

Concepts and Traditions

The nature of critical assessment and theoretical definition within architectural research is complex. Thus even the traditions of the discipline are open to questioning by other disciplines. The question of architectural style may seem to be at the route of architectural debate. Issues related to this aspect are by no means clear cut, indeed from basic concepts complex issues ensue. A comment by Conley is particularly apposite in this respect. He questions: 'How do styles develop, and why do they differ so markedly? Do they succeed one another or share pertinent traits? Do aesthetic styles convey, in a broader sense, the notion of particular "manners of thinking"? Can styles be periodized and, if so, what are the ideological motivations betraying the historical schemes that also tend to produce them?'. (Conley, 1993)

One point of interest in the comparative attitudes to research of the academic on the one hand and the architect on the other is that the architect in practice perceives design competition work and unbuilt proposals as a research activity in its own right. The academic point of departure is however

concerned with the substance of defining a thesis proposal which is supported by the establishment of the originality of the research project.

There are other factors which influence the stimulation for research activity that are suggested by thinking which originates outside the narrow confines of architecture. One of these influences of some note is the cultural aspect, which is a variable that can change from decade to decade. Arguably one such change has been that of architectural research which has seen a shift in emphasis from a concern with various aspects connected to a structural understanding of the organisation of design to one in which the less tangible concept of the narrative understanding of design has been given prominence.

Observations

Whilst recognising that inter disciplinary activity can stimulate research the discussion of the paper illustrates the argument of the thesis that the essence of architectural research can to an extent be identified by a process of disclaiming research which is primarily founded in disciplines and methodologies other than those of architecture. Yet, that argument implies that the subject of architecture has definable values which are exclusive to the subject, whereas in reality it is often difficult to distinguish those values which are due to the nature of the discipline of architecture.

The paper attempts to define boundaries to the subject area of architecture and to identity some of the contents of architectural research whilst observing the contrasting notions of building performance with the philosophical basis of architectural thought. In the final analysis however the discussion of Wollheim may set the seal for considering the boundaries of architectural research. Thus it may well be impossible to provide a definition of the content but that a more rewarding approach would be to identify research that has an architectural content (Wollheim, 1970).

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MODALITÉS D'UNE RECHERCHE SUR LA PERCEPTION DE L'ENVIRONNEMENT CONSTRUIT

Réflexion basée sur les recherches menées à l'Institut Supérieur d'Architecture Saint-Luc Bruxelles

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Les recherches effectuées à l'Institut Supérieur d'Architecture Saint-Luc, dans le cadre des mémoires de fin d'études et sous la direction de l'auteur, ont pour but une meilleure compréhension de la relation homme - environnement construit. Elles ont pour support commun la Grand-Place de Bruxelles, et font appel ê des techniques issues des sciences humaines, adaptées aux caractéristiques du support d'analyse. Enfin, la programmation des recherches est basée sur la conviction que c'est par la patiente accumulation des analyses contenues dans chacun des mémoires, et leur mise en relation que l'on pourra atteindre l'objectif précité.

Pareilles recherches, à propos des modalités de perceptions et de pratiques de l'environnement construit, font appel à diverses disciplines scientifiques issues des sciences humaines, tout en restant ouvertes à l'influence d'autres disciplines, tels les arts pour leur approche sensible des phénomènes étudiés. La mise au point des expérimentations, tant au niveau des modalités de la collecte des données qu'au niveau de leur analyse, se base sur mon expérience auprès du Laboratoire de psychologie de l'environnement construit de l'Université de Tokyo; laboratoire mené par des architectes, pour des architectes.

Espace public par excellence, la Grand-Place de Bruxelles offre un triple avantage à ces recherches : présenter une richesse de stimuli perceptifs, effet d'une architecture de masse et de surface, ou de < dentelle >; d'offrir un large éventail des échelles présentes dans l'environnement construit, du micro au macro; et enfin d'être connue de tous, en Belgique comme à l'étranger.

Au travers des mémoires, les recherches prennent la forme de micro analyses qui s'articulent en cinq étapes majeures : la définition d'un champs

d'analyse borné dans l'espace et dans le temps, mais aussi quant aux modalités de perceptions envisagées et au type de comportement et d'usage; la collecte de données, par observations in situ ou par questionnaires, effectuée sur base d'hypothèses posées quant aux facteurs présumés agir sur le comportement par le biais de la perception de l'environnement construit; le traitement des données privilégiant les modes d'analyses graphique aisément maîtrisables par l'architecte, et la confrontation des hypothèses à l'analyse des données collectées; l'isolement d'agents, constants ou variables, susceptibles de modifier le comportement de l'usager par le biais de sa perception de l'environnement construit, et leurs relations éventuelles; des tentatives de modélisation des relations entre divers agents, dans le but d'une ébauche d'aide à la décision de type multicritères permettant de concevoir une architecture recentrée sur l'homme et basée sur une meilleure connaissance de sa relation à l'environnement construit.

L'option d'une fragmentation en micro-analyses suppose une stratégie unificatritrice qui s'articule selon trois axes : accumulation, gestion et synthèse. Qui se traduit en un processus itératif établi sur trois niveaux - observation, analyse et modélisation - et réalisé selon trois modes : des recherches prospectives dont le but est de borner le champ d'analyse; des micro-analyses organisées en thématiques, des recherches logistiques développant des outils de communication spécifiques.

A ce jour, des recherches ont été menées, ou sont en cours, sur les thématiques suivantes : le franchissement du seuil d'une place publique, y compris la définition de la zone de franchissement et le traitement de l'angle; l'influence des parois de ruelles menant à une place publique, y compris l'isolement de facteurs modifiant le rythme d'une progression linéaire vers un objectif visuellement défini; l'effet de pente sur une aire de grande dimension, y compris les impacts sociétal et kinesthésique. Elles ont dores et déj à permis de mettre en exergue l'importance d'éléments apparemment mineurs de l'environnement construit sur le comportement des usagers des espaces publics, et d'esquisser une typologie du comportement basée sur l'usage. Viennent s'adjoindre à ces micro-analyses, des recherches sur les modes de représentation de l'environnement construit, intégrant diverses modalités perceptives.

SAVOIR & ACTION : LES "NOUVEAUX OUTILS" SONT- ILS "URBAINEMENT CORRECTS" POUR LES RELATIONS ENSEIGNEMENT/RECHERCHE ?

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Les nouveaux 3e cycles du cursus Français d'Architecture vont constituer un lieu où les relations enseignement/recherche permettront de mieux construire des acteurs de la conception architecturale et urbanistique plus conscients des implications des choix et arbitrages qu'ils effectuent et du rôle qu'y jouent les méthodes de travail acquises et leur instrumentation, notamment informatique.

La "culture de projet" se révèlant et se construisant simultanément dans la relation à l'instrumentation, où s'expriment les rapports du savoir et de l'action dans une "pensée du faire", former et observer, enseigner et chercher dans un cadre pédagogique axé sur les "nouveaux outils" est une voie de fertilisation de la pensée théorique par les développements actuels de l'activité d'analyse et de conception urbaine. Cela implique de la considérer comme située et ancrée dans la diversité des pratiques et des implications sociales des métiers, et d'aborder son instrumentation informatique comme complétant l'instrumentation traditionnelle en une coexistence nécessaire et fructueuse.

L'école d'architecture de Paris-Tolbiac et l'Institut français d'urbanisme de l'Université de Paris VIII travaillent ensemble dans un tel dispositif transdisciplinaire, liant enseignement et recherche pour le développement des outils informatiques de traitement de données urbaines. L'outil choisi, les bases de données urbaines (BDU) construites à l'aide de systèmes d'information géographique (SIG) offrent de possibilités d'articulations entre architecture et urbanisme en permettant aux futurs architectes et urbanistes d'instrumenter en commun leur compréhension et interprétation de la ville comme un systèmes de relations entre événements et objets et de tester leur connaissance des modes de production et de transformation de la ville et leurs implications.

L'intérêt majeur de ces outils pour l'articulation enseignement/recherche est triple : ils obligent à une entière explicitation des objectifs, des notions et données et de la démarche d'analyse et ils altérent la répartition conventionnelle des pratiques et approches des divers univers professionnels concernés, formant ainsi les étudiants aux futures répartitions de compétences et responsabilités et ils posent la double question de la description du "réel" sur lequel on décide d'agir et avec lequel on va projeter, et des méthodologies d'intervention sur la base d'une meilleur compréhension de l'existant.

En posant la question de la constitution même des données de la conception et de l'aménagement urbain, de leur modélisation, de la conception de leur système de relation, à la fois système d'objets de nature diverse et complexe comme l'urbanité qu'ils représentent et mise en situation du système d'acteurs produisant et gérant la ville, ce type d'instrumentation semble offrir la possibilité d'une "analyse dynamique" de la ville, par rapport à "l'inertie" de l'analyse urbaine fondée sur la juxtaposition d'indicateurs. La recherche liée à l'enseignement peut ici travailler à l'évaluation des limites d'usage de l'instrumentation mise en ouvre comme outil d'aide à la décision/conception par une pédagogie sur la constitution même des données de l'analyse et de la conception croisant trois approches complémentaires : la position particulière de l'architecture et de l'urbanisme dans la configuration des savoirs, le statut de la représentation à ouvre et le "travail" de certaines notions et modèles de représentation.

Ces cursus doivent ainsi viser l'élargissement du contexte d'exploration/-décision du concepteur. Les méthodes et techniques nouvelles, en s'y "socialisant", ne peuvent qu'enrichir d'innovation et d'expérimentations réfléchies les pédagogies, pratiques et comportements professionnels si une culture transdisciplinaire suffisante se constitue, pour participer à l'élaboration des nouveaux instruments et méthodes de la connaissance et de la conception urbaine.

HIGHER DEGREES BASED ON PROGRAMMES OF DIRECTED STUDY AND RESEARCH

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ONE WORLD STUDIES

The basic needs of the world's population, as defined by the United Nations, are food, shelter, potable water, health, work and education. All these needs find expression and must find satisfaction within every human settlement. The problem is particularly visible where there is a vast influx of population into urban areas. The architect and planner can only contribute to the satisfaction of these basic needs by recognising their interdependence. We believe that 'Shelter' makes no sense when planned without reference to infrastructure, health and work.

Our strength at York is our recognition of the fact that every country has its special problems and concerns and that every student has his or her own enthusiasms and that any worthwhile research should be related to these needs. One set course can seldom be relevant to the situations of all countries and all applicants. 'Personalised' study enables the students (and the sponsoring institution in the home country) to determine the subject matter most appropriate to the housing, planning and building needs of the country in which he or she works. We therefore aim to broaden the professional's perspective by helping them to see their chosen problem in a context of social, economic and cultural development.

Many of the students who attend the Institute to follow this course in the built environment, come from countries formerly known as 'developing' or 'Third World'; some of our students today come from European countries but the course perspective is global. One of its most productive features is the interaction between individuals from several different countries and the exchange and testing of ideas that becomes possible when students from a variety of backgrounds and cultures meet on a regular and organised basis. Wherever the students have come from or taken their first degrees, they have in common very little experience of writing a dissertation, assembling evidence and developing an argument; in other words of 'doing research'.

Our objectives are to provide a course structure which gives students a strong foundation in research principles and methods, writing and presentational skills, confidence in group discussions, as well as chairing and organising workshops/conferences.

We try to maintain a flexible approach to the teaching and learning process to make the most of the individual students qualities to benefit their specific research programme. This involves providing a variety of learning experiences to take account of the fact that different students learn in different ways, and that different research subjects require different approaches, such as:

- innovative methods of research development; notably student workshops, a range of outside advisors, structured study visits and practical encouragement to attend and present papers at national and international conferences;

- high level of individual attention through the supervisory system and through careful monitoring of academic progress. In the case of our overseas students particular attention is given to their use of language and general welfare;

- assessment and monitoring procedures that enable students to recognise the knowledge, understanding and skills we expect them to develop and which allows their progress to be monitored;

- an effective system of support for students and opportunities for them to provide feedback on their experiences;

- a high-quality academic environment which integrates the Institute's taught and research activities, involving staff, working space and buildings which encourages continuing development of students' work.

Graduate work in the Institute lays stress on breaking down traditional boundaries of research in Architecture; much of it is of an interdisciplinary nature encompassing the Built Environment in general. Great stress is laid on the supervision and care of graduates; perhaps for this reason, in recent years our research degree students have achieved excellent completion rates and the research quality at both Master and Doctorate levels is widely recognised.

STUDENT SUPPORT

We find it extremely helpful to the student to have a number of external advisors/consultants. On their arrival at York, students are encouraged to develop a network of contacts in their chosen field of studies. They are introduced to local and national offices and organisations, as well as individuals. This helps the student in obtaining up to date information and keeping in touch with the latest development in his/her area of interest, as well as broadening their experience in the UK. This is an important point; many higher degree students never leave the campus, they know little or nothing of the city or country they live in. That seems to us to be quite wrong and a wasted opportunity especially in the context of studies in the Built Environment, where much can be learnt about other systems of urban/rural planning and management.

Over the last ten years the Institute has supported the organisation of student led Workshops and Conferences, as a medium for the development of academic research undertaken by scholars researching for their doctorate. The aim behind this innovative approach to formal education is to provide a forum for specialists to meet with the student and debate the issues; to receive reports on recent experience, as well as criticisms and to generally review new thinking in the light of each student's particular angle, in different subject areas studied within the Institute. We document those experiences as a series of workshop publications.

In our view, sound academic research requires much more than carrying out literature searches in libraries. We encourage students to prepare and give papers in small group workshops, Institute seminars and other venues in Britain. Furthermore, work experience opportunities and study tours are organised, as well as the opportunity to participate on all courses of relevance held at the Institute and other departments of the University.

As a direct result of our teaching and research policies and of the way we encourage our students to develop their areas of interest, a number of projects have grown over the years, from being a subject of academic interest into becoming nationally and internationally acclaimed centres of training and research; the most significant of which is the Post-war Reconstruction and Development Unit (PRDU).

"VERS UNE ARCHITECTURE OBLIQUE"

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Les recherches qui font l'objet de mon doctorat (qui se trouve encore dans une phase initiale) portent sur les 'constructions' (aussi bien mentales que matérielles) : leur effet sur le travail du projet architectonique et sur les théories de ces constructions (y compris le doctorat même en tant que 'construction'), ainsi que le rôle qu'elles jouent dans le domaine pédagogique.

La pensée de la 'déconstruction' est employée comme 'méthode en marge' pour démembrer ces constructions, pour les transformer en systèmes extrèmement complexes... afin que nous puissions retrouver la créativité, la force de l'imagination et l'inspiration qui pourraient nous permettre de matérialiser judicieusement nos responsabilités envers le monde.

Les doctorats sont écrits de la même manière dont sont construits les bâtiments, et dont sont conçues les pédagogies: ce sont des constructions en mots et images. Ces constructions liées au temps et à l'espace aboutissent à des produits finis. Ces derniers posent la question de leur durabilité, de leur résistance au changement.

L'utopie de l'architecture, (aussi bien de la pensée architecturale que de la pédagogie), ne réside-t-elle pas justement dans cette ambiguïté: qu'elle veut être en même temps le symbole de la durabilité (voire de l'éternité) et l'expression du changement.

Pour éclairer la façon dont lesdites constructions sont composées, pour comprendre leurs principes d'ordre, il faut étudier l'évolution et le pouvoir de la technique. La mise en oeuvre de la technique, pas seulement dans le sens tectonique, mais aussi dans son pouvoir de manipulation dans le contexte le plus large.

Dans le cadre de mon doctorat, ces constructions sont examinées dans leur aspect réalisable et utilisable, dans leur potentialité à matérialiser des états variables. La matérialisation et la mise en forme du processus de

transformation réduisent ces constructions à des structures ouvertes, auxquelles l'utilisateur et non pas le 'compositeur' manipule des compositions dynamiques. Cela revient à dire que ce n'est pas le résultat du processus qui est envisagé mais bien le processus en soi. L'image architectonique ne symbolise pas la dimension du temps mais l'incorpore.

La matérialisation de ces constructions est examinée dans le 'déplacement' du concept de la tectonique. La composition de la forme ('Gestallt') ou du détail architectonique peut être mise en évidence ou dissimulée. Comment crée-t-on des images et des compositions qui peuvent se transformer? Avec la déconstruction en filigranne, le concept de tectonique peut nous emener à exprimer les possibilités mêmes de transformation (aussi bien au niveau de la matérialisation que du projet).

Une architecture simultanément dotée de deux structures invite à la transformation. Cette double position permet d'évoluer dans toutes les directions: le concept ne se fige jamais et de multiples possibilités d'adaptation permettent d'espérer une survie à l'infini.

La signification de la composition et de l'image qui en résulte découle de la construction même et de son ouverture vers une relation dynamique entre l'objet architectural et son 'utilisateur'.

La notion de tectonique est étudiée à l'aide du glissement conceptuel de la tectonique entre l'architecture de Mies Van der Rohe et de celle de Hans Kollhoff et Jean Nouvel. Alors que Hans Kollhoff se situe manifestement dans la tradition du développement historique du concept de tectonique, Jean Nouvel par contre se met radicalement du côté de la technologie actuelle.

Le choix de Mies Van de Rohe est de plus justifié par sa qualité de pédagogue et par sa relation avec le Bauhaus. Par ailleurs nous envisageons d'examiner la 'construction' du discours à propos du Bauhaus en tant que lieu par excellence d'expérimentation pédagogique.

Du point de vue de projet méthodologique, l'image et son 'glissement' peuvent être mis en profit dans l'objet architectonique : ainsi on pourrait parler d'une architecture oblique. Révéler comment les choses se présentent invite à une participation active, à une permanente restructuration de notre monde afin de le rendre durable.

Cette durabilité peut être réalisée dans un trajet intégral 'entre' le travail du projet architectonique, la théorie architecturologique et la pédagogie. Ainsi nous nous mettons dans la ligne du Bauhaus dont nous essayons de réactualiser la force initiale : un engagement réel de l'architecture en face du monde.

MÉTHODOLOGIES DE LA CONCEPTION ET CONNAISSANCE DE LA CONCEPTION

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La recherche en matière de conception peut-elle viser directement l'aide méthodologique en faisant l'économie d'une tentative de compréhension de l'activité mentale autant que concrète de la conception? Il est en effet frappant de constater que la plupart des travaux s'attachant à produire des "méthodologies" sont fondés sur des logiques, algorithmes ou raisonnements qui, d'un point de vue épistéimologique autant que pragmatique, semblent en contradiction avec l'activité même de conception. Ainsi, par exemple, de méthodologies fondées sur des mises en situation de raisonnements déductifs alors que le concepteur semble mettre en oeuvre des raisonnements inductifs, plausibles, rusés, etc... Ceci invite à priviligier une interrogation sur la nature même des démarches de modélisation pouvant appréhender la conception plutôt qu' à privilégier une évaluation ex-post de la validité de tels ou tels modèles. Ceci est d'autant plus essentiel pour l'idée de doctorat que, de notre point de vue, il s'agit, dans un doctorat, de former à une intelligence des problèmes plus qu' à s'attacher à transmettre tel ou tel savoir et, a fortiori, à transmettre telle ou telle méthodologie ou méthode de conception.

REJECTING CONSUMERISM

(co-operative product design and development)

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'There is much scope, even on a single building, for the architect to work directly with industry and to be involved in the design of the products which come together to make the building, where no detail should be considered to small.' [1]

No matter how small the project or practice, if architects wish to enlarge their constructional vocabulary, they must relate to and engage in, the manufacturing process of products. Architects should begin to question the way building products are manufactured and how they perform. Many architects, either through neglect or ignorance, have become rather passive in design, assembling buildings with products identified and largely accepted as shown in the manufacturers' catalogue. The origin of this practice lies not in the architecture school, but in our consumer orientated culture: which encourages us all in the mistaken belief that the superficial variations among thousands of products available can compensate for real differences among them. The result of this consumer attitude is not just diminished performance in buildings, but a further erosion of the architect's influence in design decision making.

The use of products is an important and challenging feature of modern building practice. As building continues to move towards the collation of factory made items bounded by on-site construction, maximising off-site fabrication and dry construction, the extensive use of factory produced products is changing the building process. The machine has moved from the building site to the factory, producing a product range from off the shelf to expertly manufactured specials. The modern architect thus needs to be familiar with the parameters of the manufacturing process and its related quality control procedures, in the same way that the architect was traditionally involved in the site process. As the industry tends to refer to the research and development of a product, and never to its design, our argument is that by

urging manufacturers and architects to become integrated into the how and why of making products, and the related building, they each come closer to the heart of the project. Increasing control over both the function and aesthetics of what goes into a building.

With the potential of Europe's architectural and engineering traditions, selected European architects and manufacturers are consulted as experienced practitioners to address technical and design related issues, that are demonstrated when co-operating to design, modify and develop products. By establishing an on-going dialogue for an exchange of ideas and investigation into their working methodology, the practitioners are asked to comment on their procedures relating to design, manufacture, installation and product management. As product design and development is also about astute management, and using management based forms of contract to work with specialist contractors before and after tender. This data is collected, analysed and interpreted to formulate a working pattern, with the expectation that this analysis will be subject to an actual product test.

While the commercial world has changed, the building industry has changed very little. Perhaps in an attempt to deliver different results we should be trying to respond to markets rather than trying to regulate them.[2] While a pre-industrial relationship between clients and architects is required, a post-industrial relationship is demanded between architects and the building industry. In recognition that the manufacturer's workshop is as much the place for design as the architect's office, the manufacturer and architect have much to learn from each other. This call is for the architect to establish a relationship with manufacturers, not as passive specifier, but one of active involvement.

Notes

1. Norman Foster, AIA gold medal acceptance speech,1994.
2. Bolwijn & Kumpe, Marktgericht ondernemen, 1991.

METHOD WITHOUT THEORY IS EMPTY THEORY WITHOUT PHILOSOPHY IS BLIND

(With respects to Immanuel Kant)

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Doctoral research in architecture displays a confusing array of methods stemming from its birth in various disciplines: history, physical sciences, and human sciences. In different Colleges of Architecture generally one methodology for doing research is favored depending upon its particular history and founders. It is our view that the quality of research in architecture would benefit from a deeper understanding of the underlying assumptions that support a range of theories and methodologies. All programs that purport to produce new knowledge through architectural research should include a course in the philosophy of research.

At Texas A&M University we have a program that consists of 40+ Ph.D. students whose research emphases range from highly technical to extremely theoretical. Our program stretches across at least 10 very diverse realms. In our experience, entering Ph.D. students are unaware of the broad range of methods that they may potentially use to frame their particular research question. They are unaware of the powerful tie between a particular method with its process for coming to know the world, and the underlying assumptions it presents as a world view. To respond to this deficiency we offer a course during the student's first semester that structures a dialogue between subjective and objective world views through a model of research that includes concepts of facts, understanding, and knowledge. The following is an outline of the course:

FACTS are the circumstances or instances of a case to be obtained through three basic processes:

Sense Data are direct, existing phenomena separate from the receiver.

Intuitions are the immediate apprehension of an object by the mind without the intervention of any reasoning process.

Perceptions are the taking cognizance or being aware of objects in general.

The debate about what "facts" are leads to the following comparisons:

Rationalism	Empiricism	Constructivism
Facts are given from within.	Facts are given from without.	Facts are created.

UNDERSTANDING is the organization of facts and the assignment of meaning. This includes basic processes of naming, belief, justification, reference, interpretation, and itentionality leading to concepts of truth.

The debate about the nature of truth leads to the following comparisons.:

Correspondence Theory	Coherence Theory
The true corresponds to reality.	The true is a coherent system of Ideas.

Realism	Conceptualism	Nominalism
Universals exist outside the mind.	Universals exist as entities of the mind.	Universals are not real en-tities in the world or mind.

Realism	Idealism
Both things and concepts have real existence. Meaning comes from the world.	The nature of reality is mental or ideational. Meaning comes from inside.

Static	Dynamic
The nature of reality is absolute.	The nature of reality is constant change.

KNOWLEDGE is a product of the combination of fact and understanding. Knowledge can be grounded in theory, expression (including artifacts), culture, or friendship. Knowledge can be modeled in the following ways1

Scale Model = all likenesses of material objects, systems, or processes, whether real or imaginary, that preserve relative proportions and selective features.

Analogue Model = shares with its original not a set of features or an identical proportionality of magnitudes but, more abstractly, the same structure or pattern of relationships.

Mathematical Model = provides the form of an explanation (it does not furnish a causal explanation), by showing what kinds of function would approximately fit the known data.

During the presentation of **facts, understanding and knowledge,** specific methods are explored through the following world views:

Rationalism	**Positivism**	**Post-Positivism**
Deductive Statements with Backing, Warrant, Grounds, and Claim.	Experimental. Verification of hypothesis. Chiefly quantitative.	Modified experimental. Falsification of hypothesis. May be quantitative.

Phenomenology	**Constructivism**	**Pragmatism**
Qualitative, Interpretive, and Descriptive. Dependence on observers.	Hermeneutic (interpretive). Logical disputation. Dependence on observers.	Action Research, use of corroborative models to govern intervention.

Systems Theory	Structuralism	Critical Theory
Historical and contextual analysis. Use of models to study system, process, and change.	Symbolic and pattern analysis. Isolate patterns and infer rules that govern a system.	Historical Analysis. Dialogic and dialectic. The art of critical examination.

Students are required to frame their research questions through deductive logic, then design their research approach and defend the underlying assumptions with respect to ontological, epistemological, and methodological positions. Each student must take a position on the aim of their inquiry:

explanation, critique, or understanding; whether they are approaching research with an exclusive or inclusive set of values; and whether they are a disinterested observer, a transformative outsider, an active manipulator, or a passionate participant.

Following this course work, doctoral students are better equipped to design rigorous research, defend their positions, and fairly critique the work of others.

Note

1. Black. Max. *Models and Metaphors*. Ithica. NY: Cornell University Press. 1962.

ARCHITECTURE: A PROFESSION AND / OR A DISCIPLINE ON THE DOCTORAL PROGRAM OF THE OSLO SCHOOL OF ARCHITECTURE

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In this paper the author presents the theoretical, pedagogical and practical grounds of the concept of research education found at the doctoral program at the Oslo School .

The premises behind the concept are: Firstly, the school as it is a university college is bound by The National Doctoral Code. The code_s four main principles concerning doctoral training are: i) a standardised time limit of 3 years; ii) obligatory, organised research training; iii) that each doctoral candidate shall have at least one formal supervisor; iv) admission to a doctoral program is formalized by a written agreement. A discussion as to the role and character of research education at national level resulted in some recommendations as to the shaping of doctoral curricula: There should be a structured transition from lower to higher levels of research; the students_ understanding of their own discipline should be broadened; and a common disciplinary identity should be developed.

The existing premises at the Oslo school has had a substantial influence on the nature of the doctoral program as it developed. Traditionally the Oslo school has emphasized design practice as the source of professional and pedogogical competence. Thus research, with a few exceptions, has been a recent activity at the school. Here, as at other Scandinavian schools there has been a strong sense of insecurity concerning the objectives of research, its methods, theories, and the skills required including criteria for evaluation of research. The doctoral syllabus presented here has developed through national and inter-Scandinavian cooperation, and has been strongly influenced by the ongoing international discussion .

International discussion has focused on the specificity of architecture as a field of knowledge and a field of research. Architecture is a professional discipline. Thus its knowledge base is closely related to practice. In Western

culture different traditions constitute their own knowledge base in architecture. The main traditions are Anglo-Saxon empiricism and European continental rationalism. The paper discusses these differences .

The concept behind the present Doctoral Program for the Oslo School of Architecture was developed from these premises. The program is formed as a series of three courses as follows:

Part 1 provides a general introduction to the _landscape of disciplines_ within which a family of professional disciplines can be discerned where each has an essence in practice. Architecture is a sub-group of these so called _the making disciplines_. The aim is to establish a sense of identity among doctoral candidates within the broader research world by making clear what research is, its the basic methodological problems encountered in research in general, and those relevant to architecture in particular. Part 2 is an introduction to the knowledge base of architecture where differences between the architectural discourse and architectural practice are emphasised, how it has varied in history and how it varies in concurrent Western traditions. The objective of Part 2 of the research training program is, in keeping to the conceptual criterion, to develop a common disciplinary identity among doctoral candidates.Part 3 is intended to provide a theoretical basis for individual dissertation topics. It is therefore tailored to the individual needs, both to the particular need of their topic and to that topics_ place in its broader disciplinary context. The objective is to support each candidate in defining the whole theoretical basis of their project.

As a kind of conclusion the paper points out some of the contributions doctoral studies bring to architecture as a profession and a discipline.

SHAPE GRAMMARS: A CRITICAL REVIEW

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Shape grammars are production systems formulated to define languages of forms. Little critical work has been done to examine the assumptions that shape grammar researchers make about architectural form and its generation, the methodology they employ, the formalism they use, and, consequently, the adequacy of this formalism to describe architectural form. After establishing the criteria for evaluating the adequacy of a given production system, this paper evaluates the shape grammar formalism. The paper demonstrates that, in its present state, shape grammar leaves a great deal to be desired in terms of the descriptive power of the formalism, its generalizability, and computational complexity. The paper concludes by exploring an alternative approach to the representation of architectural languages.

Production systems provide finite specifications for representing an infinite number of objects. The objects described by a production system belong to the language described by the system. The methods of representing languages form a hierarchy that includes regular grammars, context-free grammars, context-sensitive grammars, and Turing machines. Researchers investigating the application of formal grammar theory to specific domains of inquiry are faced with the problem of selecting a level of grammatical description that matches the language they are investigating. Domain specific evidence provides a way of comparing and evaluating the descriptive as well as the generative power of those formalisms.

For instance, linguists believe that grammatical theories should be: (1) appropriate for describing a given language (i.e., the sentences generated by the theory must be acceptable to the native speakers' intuitions) and (2) generalizable (i.e., the grammar of any given language should be constructed in accordance with a specific theory of linguistic structure that applies to all natural languages). Linguists use these criteria to match a given grammatical level with a body of linguistic evidence.

In architecture, shape grammar has been proposed as a generative device

that specifies forms in particular styles. The underlying structure of a shape grammar models that of grammars that represent strings of symbols. It can be argued that analogous criteria to those used for evaluating natural language grammars can be used to assess the adequacy of the shape grammar formalism. Shapes can be defined formally as sets of line segments. However, to insure their uniqueness, shapes are defined as sets of maximal lines. Gips and Stiny (1980) have formalized the theory of shape grammar to represent families of shapes by allowing for: (1) parametric variation in the way the coordinates of the shapes are defined and (2) addition of parametric labeled points to differentiate between terminal and non-terminal shapes.

When they were first introduced, shape grammars were thought to provide a solution to many of the problems pertaining to architectural form and its generation. Among others, these problems include, meaning, aesthetic evaluation, explanations of a design process, and cross-referencing different styles. This paper demonstrates that solutions to many of the aformentioned problems remain untenable given the current form of shape grammar. An alternative methodology for representing languages of form based on morphological analysis is presented.

The alternative approach allows for forms to be represented without reference to a particular style. The approach assumes that style can be identified as patterns that emerge through the analysis of configurations of architectural elements and not as the defining characteristic of an architectural grammar. Moreover, the proposed approach represents architectural form using a number of levels of abstraction that start from topological relations representing the underlying structure of a design parti to more specific formal relations between space-defining elements such as walls and columns.

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DEVELOPING A VIEW ON THE COMMUNICATION OF BUILDING PRODUCT INNOVATIONS TO ARCHITECTS

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Although the architect's responsibility for building product selection has declined in recent years, they are still the most influential and important decision maker in the British building industry. The process of product selection is clearly an important part of design process, but this process has been largely ignored in published literature to date.

Whilst there have been advances in building technology, new materials and standard component design, research suggests that architects are slow to adopt these innovations, preferring to stick to a 'palate of favourite products'. In order to consider a building product for adoption the architect must be aware of it, therefore, the communication of information about new products to the architect's office will affect the likelihood of selection. Interviews with building product manufactures have confirmed that despite their advertising campaigns architects often remain unaware of their products.

This paper looks at the process by which architects become aware of products that are perceived as new to them, 'building product innovations', and the factors which influence this communication process. It is concerned with a part of the design process, detail design, that has been ignored by the design methods authors and on which little research has been published. The paper draws on the large body of both diffusion literature and communication models to advance an 'active' and 'passive' model of communication, which is then compared against a case study.

An architect engaged in the detail design stage was observed, candidly, then interviewed about his decision making process and, in particular, his search for information. The case study provides an example from which questions relating to the communication of building product innovations to architects are addressed. The study suggests that the receptiveness of an architect to building product innovations is likely to be influenced by the stage that the architect is working on a particular project.

Diffusion studies have questioned whether it was the need for an innovation, or the awareness of an innovation, which comes first in the innovation-decision process. The case study has indicated that architects actively search out building product innovations when the need arises, and not before. It is not, therefore, the communication of information about building products to architects that is critical to the diffusion of building product innovations, it is the architect's ability to search out information about them.

A GRAMMAR FOR THE ANALYSIS AND DERIVATION OF THE GEOMETRIC STRUCTURE OF ORTHOGONAL ARCHITECTURAL COMPOSITIONS IN PLAN

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This paper proposes a universal grammar that can account explicitly for the formal relations of the elements that constitute the underlying geometry of orthogonal designs in plan. It consists of an initial shape I0 and six shape rule schemata: (1) a start shape rule schema, R1, (2) an operational shape rule schema, R2, (3) label movement shape rule schemata, R3, R4, and R5, and (4) a termination shape rule schema, R6.

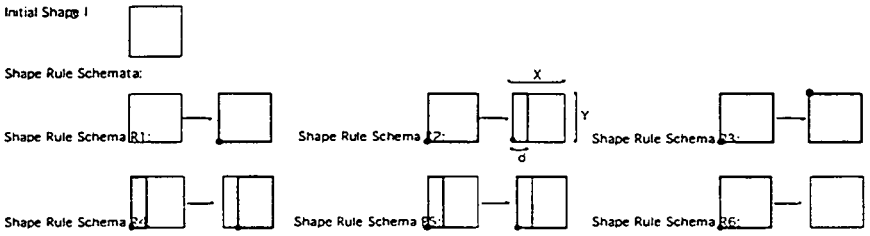

Fig. 1 The Grammar

Shape rule schema R1 applies to the initial shape I0 and places a label, ●, at its lower left corner. Shape rule schema R2 applies only to labeled shapes. It divides a labeled shape into two subshapes. The divided shape is the mother shape. The resulting shapes are the subshapes of the mother shape. Shape rule schema R3 applies only to labeled shapes that do not have a subshape. It moves the label from the lower left corner of the labeled shape to its upper left corner. Shape rule schemata R4 and R5 can apply only to shapes generated by R2. R3 moves the label from the lower left corner of a subshape A to a subshape B. Shape rule schema R5 moves the label from a subshape to its mother shape. Shape rule schema R6 deletes the label.

The grammar can be used to analyze the geometric structures of existing buildings and to derive geometric structures for new designs. The derivation of new geometric structures includes; (1) applying R1 to the initial shape , (2) applying R2 to the labeled shape produced in step 1, (3) applying recursively

R2, R3, R4, and R4 to subshapes produced in step 2, and (4) applying R6 to delete the label and to conclude the derivation process. The analysis of the geometric structures of existing buildings begins with an existing plan. First, the plan is abstracted into a geometric structure: a configuration of lines defining squares and rectangles. Second, shape rule schemata are employed to analyze the resulting geometric structure.

To demonstrate the derivation and analysis capabilities of the grammar, it is used to derive the geometric structure 2a and to analyze the geometric structure of the Villa Malcontenta by Palladio (see Fig. 2b). The derivation of the geometric structures 2a and the analysis of the geometric structures of Palladio' s Villa Malcontenta are illustrated in Figures 3 and 4, respectively. Note that the derivation of the geometric structures 2a will be described in details to familiarize the reader with the grammar.

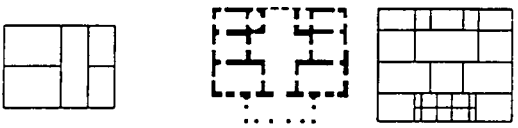

Fig. 2 (a) A Simple Geometric Structure and (b) The Plans and Geometric Structures of the Villa Malcontenta.

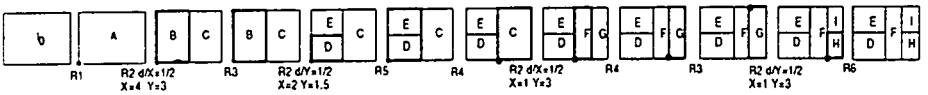

Fig. 3 The Derivation of the Geometric Structure in Fig. 2a

The geometric structure in Figure 2a can be derived by the following sequence of rules (see Fig. 3). Shape rule schema R1 is applied to the initial shape. It generates the labeled shape A. R3 is applied to A. It moves the label from the lower left corner of A to its upper left corner. R2 is applied to A. It divides A into B and C and attaches the label to B. The ratio d/Y is 1/2. R2 is applied to B. It divides B into D and E and attaches the label to D. The ratio d/X is 1/2. R4 is applied to D. It attaches the label to E. R3 is applied to E. It moves the label to the upper left corner of E. R2 is applied to E. It divides E into F and G and attaches the label to F. The ratio d/Y is 1/2. R4 is applied to F. It attaches the label to G and moves the label from the lower left corner of F to the lower left corner of G. R2 is applied to G. It divides G into H and I and attaches the label to H. Finally, R6 is applied to F. It deletes the label and concludes the derivation process.

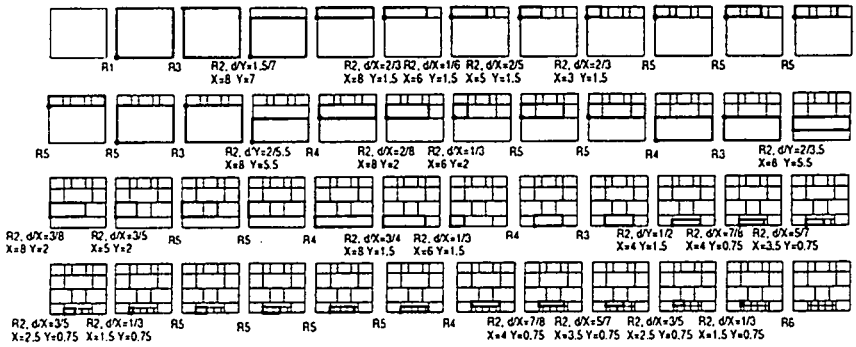

Fig. 4. The Analysis of the Geometric Structure of the Villa Malcontenta

A universal geometric grammar that can describe explicitly the morphological operations involved in the generation of geometric structures of orthogonal architectural compositions in plan was presented. Its derivation and analytical capabilities were tested using two case studies. It is suspected that this grammar can be applied to the geometric structure of orthogonal architectural compositions in section and elevation. This will be the topic of future research by the authors of this paper.

TERRITORY CITY

congestion and dilution of the 'full' country.[1]

Architectural and historical survey to urban and landscape structures of the Dutch delta.

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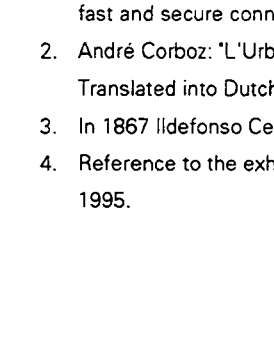
This study raises the matter of the urbanization of the Dutch territory in order to question the possibility of durable and specific urban and landscape forms under conditions of a general and dynamic 'urban' attachment of the territory.

Thesis is that urban space in the Netherlands now encompasses dwelling, working, recreation, infra-structure as well as nature. In that sense the traditional oppositions of city vs country, centre vs periphery and culture vs nature dissolve in a collage of different shades of urbanism. This dispersion of urban forms exceeds urban sprawl. It entails an urban way of life that affects the whole territory, and is related to the contradictory tendencies of congestion (the 'compact city' and sub-urbanization) and dilution (leisure and nature-development). It is also linked to the paradox of de-territorialisation, caused by media, mobility and telematics, and on the other hand, re-territorialisation, motivated by a desire for cultural identity.

Although the issues above enter contemporary conceptions, most of these conceptions lack a historical perspective. In this respect the concept of 'ville-territoire' (Corboz,1991) is more promising.[2] Corboz gave a broad basis to this urbanistic concept, providing a systematic reading of fundamental treatises on urban planning since 1867 [3]. For the Netherlands, this idea enables a historical critique of the actual physical planning and an analysis of current multi-territorial urban formations. The motivation for the choice of this territory consists of the fact that the Netherlands is Europe's most urbanized country. It has a long tradition of considering its landscape as an artefact, or even as a work of art.[4] Recent developments ('globalization' of economy, politics and culture) seem to encourage this thinking in terms of 'tabula rasa',

but appear not to be affected by instruments of physical planning, which are still based on the positivistic notion of a total and absolute order. There is a question of a consistent logic of 'fragments'(local) and 'chaos'(global), and of the barely perceptible order in which both are framed (which is also the logic of the periphery).

To incorporate these notions in a design theory a historical by-pass will be made, leading to the hypothesis: 'Territory-city Holland as Campo Marzio'. Piranesi shows in his Campo Marzio [1762, ill.1] the paradox of fullness and emptiness in a city that transcends its boundaries and loses the classical order of ground and figure as well as the logic of parcelation and infrastucture. A close arrangement of fragments effaces a total order, not only in favour of compact fragments, but also of empty in-between spaces. To elaborate the concept of territory-city the study will focus on the implications of this hypothesis, and formalize possible proto-typical fragments, defining the Dutch territory in their repetition and differentiation.



Ill.1 Detail from Giovanni Battista Piranesi, Il Campo Marzio dell'Antica Roma: Ichnographia (1762)

Notes

1. The notion 'full country' refers to the dissertation of prof. A. van der woud on the 19th century physical planning in the Netherland, called: "The empty country" (Baarn, 1987). This study stresses the opening up of the country by fast and secure connenctions.
2. André Corboz: "L'Urbanisme du Xxe siÅcle. Esquisse d'un profil", Zƒrich 1991. Translated into Dutch in Archis 5-1992, pp 49-52.
3. In 1867 Ildefonso Cerdç published his "Teoria general de la urbanizaciùn".
4. Reference to the exhibition "the Netherlands as a work of art". Rotterdam (NAI) 1995.

DESIGN THOUGHT AND DESIGN PROCESS: MAKING VISION VISIBLE

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Within the field of design engineering methodologies based on principles of technical rationality are prevalent. These methods focus on an analysis of sub-problems and a definition of objective requirements in order to predict the properties of the design solution. Although the need for an integrating principle is often acknowledged (e.g., Roozenburg & Eekels, 1995), this essential design-aspect - which is linked to subjective processes of e.g., intuition and creativity - is not incorporated in the methodology. We will denote this principle as 'vision'. In this paper the dimensions of the vision-concept are explored and a frame of reference for future research and applications is formulated.

Our point of departure is that designers and users are part of the same cultural system. In this system users adapt to their environment (including products) and designers constantly change that environment (the products). Both parts of the system, users and products, and designers and products, as well as the system as a whole, can be characterized by a force towards stability. Within this context vision is defined as the viewpoint from which 'reality' is perceived and understood.

In each culture, members develop a collective vision of the products surrounding them which results in shared knowledge and meaning of products' functions and values. New products will be understood on the basis of this shared vision. When this is the case, the stability of the system sustains. However, the environment constantly changes and these changes affect the stability of the system. Up to a certain level, the system can resist these forces towards instability. Some products can however disrupt the balance and afford a change of perception, i.e., a new vision. When this so happens, and the product is understood in a fundamentally different way, we call it a visionary product. These products are better adapted to the changing environment.

A product designer is part of this same system. He usually shares the collective vision and will design products that fit into this view. In the design

process available knowledge will determine his alternatives and choices. Some designers, however, are able to let go off this shared vision; their design process is based on a radically different one. This new vision can lead to products - visonary products - that are better adapted to current environmental changes or anticipate future changes. Possible attitudes and ways of thinking will be described that can support a designer to escape prevalent knowledge and meaning structures. Moreover, it is argued that the user-designer-environment system can be conceived of as a self-organizing dynamic system.

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INVENTING A PROGRAM FOR THE IN-BETWEEN IN AMERICAN CITIES

Undergraduate architectural design studios at Florida International University

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What's missing in this city is not a matter of any particular building or place; it's the spaces in between, the connections that make sense of forms... Obsessed with the point of production and the point of sale, the new city is little more than a swarm of urban bits jettisoning a physical view of the whole, sacrificing the idea of the city as the site of community and human connection.

Michael Sorkin, Variations on a Theme Park

In order to re-establish the human connections within the downtown of American cities we should consider the re-use of residual urban spaces and ill-defined links which are a result of modern transport infrastructures. These unresolved spaces within modern cities create a confusing yet potentially liberating situation. For it is here, in-between, that traditional planning methods have become obsolete and that unconventional programs, new orders, relationships and types of urban spaces can be manifested.

Possibilities for new programmatic combinations to revitalize these dying zones are being tested in the undergraduate architectural design studios at Florida International University. The students are re-visualizing current social and spatial conditions in Miami. This critical thinking has produced ideas derived from the site, absent of preconceived notions. Within the studios, the faculty and the students have been analyzing how to transform these ideas into new building typologies. In order to engage the students in this process, they are asked to hypothesize a new architecture that reconciles site, culture and personal experience by undertaking the following four step process:

1. A CRITICAL ANALYSIS of site circumstances and spatial conditions and a RECORDING of those conditions are made. This is achieved by spending time in the context of the site and by making observations which are personally meaningful. These observations can include

conditions of light, time, social rhythms and patterns, densities, etc... The recordings are made by notating, diagramming, sketching and photographing on site.

2. A READING and MAPPING of the analysis which is defined by site circumstances and affected by personal observations is then made. The mapping is made in the studio and allows the student to analyze and dissect the observations made in step one. By editing and focusing on one aspect of the site, the student can critically study the aspect that interests him the most. During this stage, collages and diagrams are made.
3. The MAKING of a construction which explores ideas and a PROGRAMMATIC READING of the construction is accomplished by installing the construction in the context of the site. Here social behaviors are observed and ideas about possible programs can be derived. For example, a construction which focuses on issues of time and reflections could in turn produce a project such as a mobile video gallery which is experienced while on a mass transit system like the metro.
4. Finally, the TRANSFORMATION of the ideas explored in the construction are then transformed into a representation of a built-landscape environment. Models and drawings which describe a building are developed.

This process focuses on the transformation of observations into constructions which are not miniatures of buildings but rather explorations of architectonic ideas. In the process of making and installing the constructions, social behaviors are observed and programmatic propositions for these zones are generated. The process stresses the possibilities that are inherent in chance operations. By not relying on preconceived typologies, but rather, encouraging the student to assume a methodology that begins with basic research and is advanced by inventing programs that confront our current cultural conditions, the students are capable of proposing an architecture for the IN-BETWEEN.

THEORY AND PRACTICE OF ARTISTIC CREATION IN THE EARLY 17TH CENTURY

The Poetic Model of Salomon de Caus

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This study examines the status of theory in its relation to artistic practice in the "post-renaissance-pre-scientific" world of the early 17th century, as exemplified in the prolific work of the Architect and Engineer Salomon de Caus (1576-1626). De Caus wrote four theoretical treatises on Perspective, Machines, Music and Sundials. In his practice he designed gardens and grottoes with spectacular machinery for different European courts. His treatises relate to the new type of technical texts that emerged in the late 16th century testifying to the increasing respect for the knowledge of the practicing artisan. From a close study of De Caus' writings on music, where he touches on the theory, practice and actual "production" of the art, as well as from an analysis of the general composition of his texts, it can be shown that the relationship between theoretical discourse and artistic practice was of a dynamic coexistential nature. Theory and practice converged in what was the fundamental justification of human production at the time: the mediation of knowledge of the immaterial and Divine through worldly matter. Neither theory nor practice was independent of the unstable existence of the man-made world, but rather provided vital instruments for the perfection of art.

What is shown by this reading of De Caus works, in particular the treatises on machines and music, is that the instrument, not only in a metaphorical way, but also in a concrete and literal way, was still considered an intrinsic part of the conveyance of knowledge in the period preceding the era of the scientific revolution. All human artifacts thus had a crucial role to play as keys to the understanding of the whole cosmos, which of course only God could fully grasp. Had man not lived under the curse of materiality, he would, as the angels, have had access to immediate comprehension. But since fallen, man could never recover that angelical state, only through matter could he strive towards his beginning and end in God.

The relationship between theory and practice today has a very different but also more problematic nature if compared to the 17th century environment of De Caus. There is generally a deep gap between these two

"sides of the coin" while the concepts remain fundamental to all human action. In architecture this gap is represented on many levels. For example in the split between architectural research and professional practice. The significance of this study to the present condition of the architectural profession might be that it, through examining a particular historical situation where a more dynamic relation between theory and practice appears to have existed, sheds light also on the conditions governing this relation today.

This interpretation of De Caus' works reveals a poetic model for the making of artifacts in a world where the ultimate meaning resided in the Divine. Today, the disclosure of this model might suggest alternative approaches to reconnect the parted worlds of theory and practice in contemporary architectural production.

Keywords: 17th century, Europe, Salomon de Caus, Architectural Theory, Music Theory, Epistemology, History of Science, Garden History.

This paper is based on research presented in Automata, *Perspective and Music: Poetic Instruments in the Written Garden of Salomon de Caus,* M.Arch. Thesis, McGill University, 1995. Advisor: Prof. Alberto Pérez-Gùmez.

INTEGRATION OF ENERGY SAVING MEASURES IN THE RESTORATION AND RENOVATION OF HISTORIC BUILDINGS

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Synopsis

This research deals with the integration of energy saving systems, active or passive energy systems and energy conservation, in historic buildings.

The improvements of the energy performance of historic buildings must be related with the existing building characteristics and the restoration techniques selected.

The research investigates solutions for the reduction of energy consumption and integration of renewable energy systems in historic buildings. These solutions will be selected in relation with the global building restoration and architectural value. The project will bring specific solutions based on case studies into methodological conclusions showing the possibilities of application to a large stock of buildings.

Summary of the Research

In the second half of this century, the world has dramatically increased its demand for energy. Coal, gas and oil, the traditional fuels, have seen us through the energy needs of this period of industrial expansion. However these fuels are obtained from sources of energy that will one day be exhausted.

The importance of the building sector in the energy consumption can be demonstrated from available statistics on energy use.

The rate of growth of new buildings in Europe lies between 3 and 5 percent per annum, so clearly no real impact on reduction of fuel and power consumed can be made in the short term without tackling the existing stock of buildings.

About 80% of the buildings in European cities is more than 30 years old. From this percentage a considerable part is classified as Architectural Heritage that needs to be preserved.

Historic buildings ask special requirements on their rehabilitation for the preservation of their architectural value linked with actual requirements on comfort. Actual comfort and spatial needs demand a re-design and the introduction of new technologies, systems and materials within the original building.

Finding solutions to reduce energy consumption in architectural heritage in combination with the preservation of historical value of buildings is an urgent matter for the conservation of natural and cultural heritage.

This research deals with the integration of energy saving systems - active or passive energy systems and energy conservation - in historic buildings.

Restoration and renovation of a building are a good occasion to improve its energy performance of envelope and interior.

The research involves a group of buildings situated in the Netherlands which have been selected for their architectural and historical quality and which are representative of the period between 1850 and 1940.

Into these buildings will be developed solutions for the integration of energy saving systems. The solutions will present options for the re-design of the building integrating the mechanical elements of active energy systems and passive energy systems components.

The conclusions based on these solutions are the basis for the elaboration of a strategy for architects and engineers that intends to relate the reduction of energy consumption of buildings and restoration of historic buildings.

Superviser: Prof. dr.ir. F.W. van Voorden; Second-Superviser:
Prof. ir. P.G. Luscuere

Beginning of the project: 1-03-1994
Expected end date: 1-3-1998
Financial Support: Institute for Scientific Research of Portugal - Program Praxis-XXI (Junta Nacional de Investigaïïo CientÆfica e Tecnolùgica).

A VIRTUAL OFFICE SUPPORT SYSTEM FOR CONCURRENT DESIGN IN ARCHITECTURE

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Architectural practice is today in a process of radical change. The traditional definitions of tasks and assignments of responsibilities in the field of building design are under great strain, as increasing pressures for faster, more comprehensive, and more complex design services are required by our clients. In addition to this, the financial resources available to architects to carry out these tasks are decreasing. Architects are experiencing an increasing need in integrate demands of multiple technologies and points of view in building design. In response to these pressures, both clients and architects are reducing the time allotted to a project, while increasing the number and variety of consultants and other participants in the design team. Architects are, therefore, applying the principles of what in product engineering is known as concurrent design, but often without enjoying the benefits of the experience in this form of practice gained in other fields.

The Virtual Office Support System for Concurrent Design in Architecture project is an investigation into the ways in which concurrent design practices and procedures can be applied to architectural practice. The project is based on an investigation into the nature of contemporary architectural practice in the form of a pair of case studies carried out as part of an ongoing research project with the French Ministere du Logement, Division Plan Construction et Architecture, Research and Experimentation. The cases consist of two public sector projects, the Almelo Public Library, and a laboratory for the âcole des Mines. The architect's archives for each of these projects were indexed and databases created in which each document, and each message within the documents were recorded. The cases thus constitute an objective, albeit somewhat limited, view of the architectural design process as it takes place in the two countries, France and the Netherlands, represented by the cases.

The case studies will permit the development of a model of contemporary architectural design practice as a social practice, occurring between the architect, the client, and a variety of other consultants and parties to the project. The model will focus on the communication between the various

agents in the design process, and the ways in which the particularities of a given dialogue contribute to or detract from the effectiveness and efficiency of the design process. The division of labor among the agents will therefore be of significant interest. In particular, the centrality of the role of the architect in concurrent architectural design will be examined. In creating the model the techniques of dialogical modeling will be used to describe the argumentative role of messages passed between agents, while an analogy with parallel and distributed processing computer architectures will be used to describe the role of messages of various types in furthering the design process through the distribution of information and tasks.

The approach to creating the model will draw from (1) dialogical modeling (2) argumentation theory (3) the paradigm of parallel and distributed processing computer architectures, and (4) scheduling techniques to model the transmission of messages between agents in the design process, and the ways in which the messages, and their organization, are used to communicate and distribute design decisions, design knowledge, and task scheduling in order to further the design process.

Based on this model, a Virtual Office Support System for Concurrent Design in Architecture will be developed. This support system, VOSS, will assist the various agents in the design process to integrate the results of each others design decisions, and to monitor and distribute information and tasks in a more efficient and effective manner. VOSS will be designed to be of particular value in moving information from the agent generating it to agents requiring it in a prompt manner.

In VOSS, the design team will be viewed as a network, in which the task of building design is distributed among a number of agents. These agents must communicate with each other to divide the task into sub-tasks to be carried out by the individual agents, and to distribute the information necessary to carryout these tasks. In order that the network as a whole may respond to both a changing external project environment, and to the development of the design taking place within the network, the distribution and definition of tasks is treated dynamically. This reflects the need to adjust both the design itself and the plan for completing the design observed in the cases. In order to follow and support this dynamic network environment, techniques from message based parallel processing will be applied to the monitoring and control of the information flow through the network, and the scheduling of tasks.

Despite the abstract nature of the theoretical approach taken in developing the VOSS, the resulting tool will appear to practicing architects as

a relatively simple means of distributing messages, among the participants in the design process, of monitoring the progress of the project, and of revising the shared work plan for the project while underway. In doing so, the VOSS will respond to a real need in architectural practice for a better and more efficient way of carrying out design in the new and demanding concurrent environment.

Note:

This research is currently being carried out under the supervision of Prof. Alexander Tzonis, of the Faculty of Architecture, Technical University of Delft.

THE DESIGNER AS A 'HOX GENE': THE ORIGIN AND IMPACT OF VISION IN THE EVOLUTION OF DESIGN

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In describing design history, evolutionary explanations in terms of variation, selection, and fitness received much attention (see Steadman, 1979). The most important of these approaches are shortly discussed. Special attention is devoted to the nature of the variations (random versus 'intelligent'), the direction of the process (directed versus undirected) and their implications for a design method. The central problem however is: how does an evolutionary approach, essentially characterized by a gradual process, allow for the radical changes that can be observed in the history of design? Possible solutions to this problem are discussed in the light of two recent theories.

Adhering to an analogy with biological evolution designers can be conceived of as genes, the substances that control the embryonic development of organisms. Like genes, most designers construct small and random variations of an archetypical style. These variations characterize the gradual process of evolution. Recently, biologists discovered so-called Hox genes that determine the main outline of the body and can disturb the established order in a fundamental way (Carroll, 1995). We propose that 'visionary' designers function as Hox genes in the evolution of design.

The two designer types fit into Martindale's theory of cultural evolution (e.g., Martindale, 1990). Contrary to what is commonly believed, the major selection criterion in design evolution might be the analogue of sexual selection rather than that of natural selection. Unlike natural selection, this hedonic selection mechanism is directed. The assumption upon which this theory is founded is that a designer attempts to produce artefacts that are maximally pleasing. In order to prevent habituation, individual designers must outdo themselves as well as prior designers. Designers can realize this by adding small changes to existing design solutions while, at the same time, preserving its archetypical form. Their solutions, theoretically, often lack internal coherence and do not provide for major stylistic changes. At a certain moment such changes are required - the previous style is 'dried out' - and the prior design solution must be changed in a fundamental way. To initiate those

changes, designers must develop a 'vision'. By anticipating the changing needs of a society visionary designers are able to successfully introduce stylistic changes and, at the same time, preserve unity in their designs.

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THE USE OF NON DESTRUCTIVE TESTING MONITORING IN RESTAURATION AND CONSERVATION OF HISTORICAL MONUMENTS

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Introduction

This paper presents a computerized Non Destructive monitoring system which is developing at the Faculty of Architecture, division Architecture, Delft University of Technology in The Netherlands. This system is a time control of structural displacements of deteriorations.

Monitoring

Maintenance of historical and monumental buildings is a general and serious problem requiring considerable costs to find out the reasons for degeneration occurence to plan the most effective repair and to realize it successfully. Such problems can be solved by monitoring, because in this way the development of fissures can be observed, thermohygrometric condition, relaxation of constructions and first of all the protection in case of developed decay of a constructions which can lead to loss of its stability.

Measurements tranducers:

- (T) Temperature
- (V) Humidity
- (O) Cracks
- (I) Inclination
- (P) Pendulum
- (N) Level movement
- (S) Foundation settlement
- (P) Underground water level

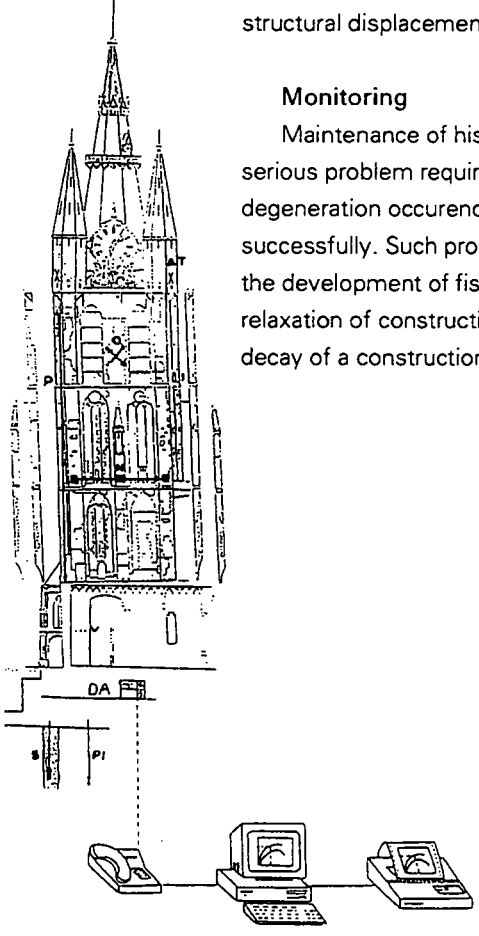

Fig.1 Monitoring system scheme

Using tranducers which can convert physical phenomena such as temperature, force, sound, pressure, light and position to a measurable electrical quantity, such as voltage or current, it is posible to folow the evolution of structural cracking, thermo hygrometric conditions, structural displacements and other sources of material and structural deterioration occuring within a time domain.

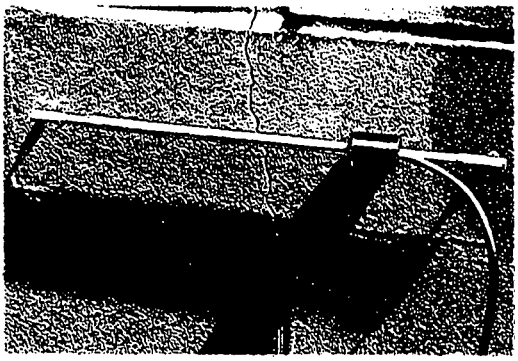

Fig.2 Crackmeter tranducer

The data acquisition (DA) unit connected to the measuring tranducers is based on a programmable microprocessor which collect analogic and digital signals. This unit, using a modem, submits the data by phone to a central control point, where the received data are read and processed by a personal computer.

Conclusion

The Continous monitoring of historical monuments appears as an effective preventive measure, especially in case of advanced deterioration of a structure which can lead to a complete loss of its own stability. Monitoring is therefore not only useful but in fact an essential technique for safety of structures and their users.

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DOCTORAL RESEARCH IN ARCHITECTURAL SCIENCES AT THE KU-LEUVEN

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The KULeuven (Catholic University Leuven) is slowly building up a tradition in doctoral research related to architecture and urbanism. Although there is no fully developed doctoral programme, a considerable amount of candidates have obtained their PhD in the last fifteen years. Throughout this period certain criteria and expectancies have been developed, which have given rise to a certain pattern of doctoral research. This pattern has to do with the specificity of architecture and urban design and the consequences thereof for conducting scientific research.

In general one can state that the doctoral research carried out at the KUL wins its empirical basis from indepth elaborated case studies, which are based either on field work, on study of the existing literature or on investigation of historical (archival) material, or on a combination of these things. The case studies are always approached by an architectural way of thinking, stressing the importance of spatial realities. The interpretation of the case study material is supposed to be informed by the latest developments in specific areas of history or theory and to contribute something new to the further evolution of these sciences.

What is specific about this methodology, and what differentiates research in architecture from other disciplines, is the unique relationship between case study material and theoretical considerations, which are intensively interconnected throughout every stage of research and writing.

OCCUPIED TERRITORY

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The ideological relations of an activity are rarely criticised within a discipline itself. Cultural practices police their institutional boundaries, by suppressing internal discussions that undermine their 'autonomy', and question their role, status and function in society. In architecture, the self-regulatory mechanisms, such as professional bodies, educational institutions, and architectural magazines exclude attacks on the integrity of the discipline. In particular, architecture's professional status has insulated and isolated it from progressive research, crippling its response to the developments made in parallel fields. In any historical period, architecture adopts a number of forms and roles, but usually one purpose, code and set of restrictions dominates the others. Therefore, the established procedures for the production of visual and textual work define the limits of architecture. This situation suggests a very simple, but heavily loaded, question. Why do we discuss, and construct, architecture in the way we do?

In order to question the forms of power in architecture, we must analyse the procedures by which the terms of architectural discourse are constructed. To transcend the limits of contemporary architecture, we must expand the terms of its discourse. Two 'rules' of architectural discourse deserve particular attention. Firstly, architectural criticism so often focuses on the individual project but ignores the terms which frames this language. The terms, such as space, site and form, by which architecture is defined and judged, are themselves historical and ideological not neutral and universal. Secondly, the myth of historical linearity and progression must be exposed for all its clumsy pretension. With the exception of the Surrealists 'Paranoid Critical Method', the linearity of thought is a burden on architectural design and history. In opposition to linearity, Deleuze and Guattari's description of smooth space suggests the nomad and rhizome as models for the spatiality of cultural production. Applied to architecture, this suggests a series of distinct but dependent procedures. As there is no singular 'form' to space, the consequences of a spatial agenda will not be uniform but they can transform the ways in which architecture is used, produced and discussed.

The replicant, a nearly perfect simulation of the human form, is a familiar icon of science fiction. The genetic confusion associated with the replicant is analogous to the disciplinary confusion in architecture. The term 'architect' is enshrined in law, but the word 'architecture' has no such legal protection. The architect is a professional, and so is the historian. To a considerable extent both groups monitor and patrol their domains, in order to exclude intruders from without, and critics from within. However, once we accept that the separation of historian and architect is ideological, we can start to transform this relationship. In refuting the disciplinary autonomy of historian and architect, connections between the text and building can be explored by the same person. Implicit within this is firstly, the undermining of cultural divisions between form and theory, language and practice. Secondly, the undermining of disciplinary divisions, between artist and architect, historian and writer. There is a danger that, in even citing a dialectic, any further investigation remains caught in an insidious scenario of binary oppositions. However, the division of text from image, and theory from practice, can be challenged by a re-working of the terms themselves, so that they exist within each other, rather than side by side. Consequently, Doctoral research can address, in equal measure, design and theory, image and text. Ultimately, 'what is architecture?', is a challenge, not a limitation.

WHAT KIND OF ACCOUNT OF ARCHITECTURAL DESIGN ACTIVITY IS POSSIBLE THROUGH THE USE OF RETROSPECTIVE REPORTING OF DESIGNER BEHAVIOUR ?

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A number of studies into architectural design have been carried out that have relied on the designer's retrospective account of the design process. Such studies must make assumptions about the validity of such an approach and its ability to elicit a variety of knowledge-types used during the design process. If the findings from this type of research are to maintain credibility then such assumptions must be stated explicitly and their validity fully evaluated. Studies conducted in the area of knowledge elicitation have critically assessed the effectiveness of retrospective reporting and have drawn on theories of cognitive activity developed in cognitive psychology to interpret the findings (see Ericsson & Simon 1980). This paper explores the usefulness of developing an appropriate knowledge elicitation methodology for obtaining valid and reliable retrospective reports of the design process in architecture. Limitations on the use of retrospective reporting, together with an evaluation of the knowledge forms that can be reliably obtained, and suggestions for structuring an elicitation exercise based on a selection of interviews with designers will be discussed.

The aim of this discussion paper is to provide a theoretical basis for the use of retrospective reporting in an on-going research investigation into the design methods of designers of exemplary industrial buildings in Europe. Therefore, the nature of the research subject dictates that reliance is made of retrospective accounts, as the buildings must be complete and in use to have been assessed as exemplary of this building-type. The designers establish their design objectives and evolve a suitable procedure for achieving them. How much one can extract directly by questioning the designer about his aims, the chosen means of achieving them and the underlying values which these aims are based on is the main theme of this paper.

As part of this research project, this paper examines the developments in the theory and practice of expert knowledge acquisition. It attempts to

provide methodological support for the use of retrospective reports of the design process, in obtaining a greater understanding of the relationship between design methods and design outcomes. Such studies have provided valid and reliable data and led to new insights into the nature of the design process (see Darke 1979). The data obtained from a series of interviews with architects, was subjected to the application of a theoretical structure developed in knowledge elicitation research for expert systems design. This structure identifies two different classes of extractable knowledge involved in expert problem-solving, and outlines the limitations on the use of direct elicitation techniques to access them. Garg-Janardan and Salvendy (1988) classified expert knowledge as: **'content knowledge'**; *"the actual facts and rules used by the human [expert] in solving problems"*, and **'process knowledge'**; *"the strategies and procedures used in problem-solving"*. Wood and Ford (1993) have suggested a similar distinction in developing a methodology for expert knowledge elicitation which allows for the virtual inaccessibility of process knowledge when relying on the direct questioning of the expert. The interview data tended to confirm the relative difficulty in extracting process knowledge as opposed to content knowledge. Also, the problem of 'common connotation bias' (see Wood & Ford 1993) is a particular concern in this type of research where the researcher and subject share the knowledge-content terms and expressions, but may not necessarily hold exactly the same meanings for them.

Finally, the conclusions drawn in the paper are that direct elicitation of domain knowledge from designers can provide reliable and valid data, but only if set within a well defined methodological structure. This methodology should make evident the assumptions made about the nature of the knowledge-base that the researcher is interested in acquiring, and define the extent to which the techniques it adopts can obtain a complete description of that knowledge-base.

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'DYKE-RELATED BUILDINGS: THE NEED FOR INTEGRATED RESEARCH IN A VERY DUTCH ISSUE'

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In the unique Dutch river dyke landscape dyke strengthening is now being carried out. This large-scale process so far has had a great impact on the landscape. The emphasis on hydraulic interest resulted in too little attention for the so-called LNC values (L for landscape, N for nature and C for culture, that is to say historical landscape values), which were systematically overlooked and got lost. Between the various LNC values there is competition too: natural elements sometimes were saved at the expense of historical landscape elements (which form the subject of this research-programme). Those historical landscape elements that were preserved mostly were houses, selected in an art-historical way, so that only houses of high standards were saved and again sometimes at the expense of other historical landscape elements. The dyke itself for example, which often dates from the Middle Ages, was sometimes diverted to save one single house. Thus, every relationship of the saved buildings with their surroundings was broken, depriving them of their context.

This object-oriented approach will never do justice to the complexity of the landscape and should therefore be replaced by a more integrated method, which stresses the relationships between elements and their surroundings and shows the historical development of the phenomena. By considering structure in different periods, the constellation of processes (the process structure) that formed the landscape in each period can be revealed.

By analysis of the design, in a broad sense, of the landscape of dyke-related buildings, the landscape can be redesigned in such a way that more quality can be obtained in terms of perception and habitation. Effects of interventions like dyke strengthening on the system formed by dyke-related elements have to be assessed and considered in the historical context. This also applies for dyke-related buildings to be designed in the future.

In this way the present can be surpassed as the only frame of reference for looking at the existing historical material. Exploring the process-structure dynamics produces information that is essential to making well-considered choices in questions of preservation as well as redesign.

Regarding the historic landscape as a kind of system gives an impetus to the integrated approach. New methods for this integrated approach have to be developed. There is a strong geographical component in this kind of research, because the constellation of processes can show regional differences, due to different physical, socio-economic, historical and traditional features. Besides, the micro-scale relationships between dyke-related elements and their surroundings have a spatial character. With the emphasis on development it will be clear that it is a matter of historical research as well. Finally, dyke-related buildings being the main subject of interest, the field of research consists of geographical, historical and architectural components. The multidisciplinary character is tackled by integrating architecture and historical geography, the latter adding a surplus value because of its structure- and process-oriented character and including both history and geography.

In this research programme there is an emphasis on dyke-related buildings, because building is regarded as the intersection of relationships in the landscape. Many factors, which are supposed to act upon the occurrence, characteristics and disappearance of dyke-related buildings, such as the body of the dyke, flooding, regulations enacted by water boards and socio-economic differences and the possible interrelation between those factors will be investigated. For instance, attention will be paid to interrelationship between parcellation dynamics, building history, socio-economic and hydraulic trends. It is important to be aware that the present houses make up only a selection of what existed in earlier days, showing the influence of low-quality building material and design and other factors. Because the art-historical method, which usually doesn't pay much attention to interior and construction, overlooks the fact that many houses have a renovated exterior or are rebuilt on an older site, other dating methods will be used. The regional differences will be traced, as well as their explaining factors (not being mere local tradition).

This research programme is performed at the Faculty of Architecture of Technical University Delft, in cooperation with the Department of Historical Geography of the DLO Winand Staring Centre for Integrated Land, Soil and Water Research (SC-DLO), Wageningen (NL). SC-DLO adds its expertise in integrated monitoring of landscape interventions and in using advanced technology, such as geographical information systems.

SUR LA PENSEE CONCEPTUELLE CHEZ ARATA ISOZAKI

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Les travaux d'Arata Isozaki, l'architecte Japonais, figurent bien différentes et spécifiques sur le domaine international d'architecture. En explorant son oeuvre (batiments, articles, critiques, etc.) sur littérature, la communication propose d'aborder la pensée conceptuelle, stratégie et attitude individuelle chez Arata Isozaki. L'Architecture habituelle chez lui se transforme en philosophie critique sur la civilisation du vingtième siècle.

D'après l'analyse générale de l'oeuvre d'Isozaki, on peut aborder sa pensée conceptuelle en trois périodes.

Première période (1960-70): Au début des années soixante, ses discussions avec Kenzo Tange, le chef de l'atelier où il travaillait durant dix ans (1), et ses visites de l'Italie (Florence, Sienne, Toscane), des Etats-Unis (New York, Los Angeles) ont exercé une grande influence sur la pensée d'Isozaki. La visite d'Italie a suscité un intérêt considérable pour l'architecture Renaissance. Après la visite des Etats-Unis il a écrit dans l'article "Villes invisibles" que villes n'avaient rien de réalite que lumières de néon et de réclame. Il est arrivé à l'intention de rénoncer à l'architecture moderniste. Isozaki écrit d'utiliser sept méthodes de conception à ses batiments dans cette période: 'Pièce de jeu d'échec', 'Coupe en tranche', 'Projection', Emballage', 'Transferal', 'Réponse' et 'Amplification', (2). La particularité commune à cettes méthodes est déviter le caractÅre facile et anonyme de l'Architecture moderne.

Deuxième période (1970-80): Dans la première moitié de cette période, on voit Isozaki employer obsessivement les formes pures et géometriques (cube et cylindre) (3), (4), à ses batiments (Gunma 1974, Kitakyushu 1975, Shukosha 1975, Fujimi Club 1974, etc.) et à la conception de quelque bijou. Le choix de cettes formes n'est pas par hasard. Il trouvait ainsi l'occasion de développer son attitude contre l'architecture moderne. "...alors que les formes

platoniciennens renvoient dans le modernisme à une pensée de l'ordre, chez Arata Isozaki elles sont vides..." L'emploi des formes pures, l'insistance rhétorique sur le cube et cylindre n'est qu'une parodie ironique, (5). Dans la deuxième moitiéde la période, Isozaki écrit, (6), qu'il a développé son attitude maniériste a l'aide de sémiologie, de linguistique et de formalisme, et qu'il est arrivé ainsi à la méthode de design dite "Manière Métaphorique". En plus, il a exposé par une affiche les neuf sources des citations (Marilyn Monroe, Dadaïsme, Renaissance, Fables, Ying et Yang, Technologie de l'espace) et les neuf métaphores (Mythologie, Sémiologie, Machines, Formes pures, Lettres, Ruines, Psychologie, Culture) dans son architecture. Le batiment Kamioka (1978) est un exemple intéressant. Dans ce batiment "..cubes et cylindres coupés et liés l'un à l'autre par des courbes à la Marilyn Monroe enroulées autour d'eux d'une manière blasphématoire... Les formes platoniciennes d'Arata Isozaki ne sont pas la représentation d'une idée sublime mais un simulacre", (5).

Troisième période (1980-90): Exemples Tsukuba (1983), MOCA (1986) et Mito (1990) caractérisent cette période, (7). A Tsukuba, s'opposer au Modernisme (et son concept de planification urbaine, son 'allusion d'artiste créateur') est le but de la conceptin. En plus, on a envisagé ces particularités qui n'existaient pas à la ville de Tsukuba: 'Labyrinthe', 'Théatralité', 'Complexité', 'Ambiguité', 'Symbole', (8). Ici, les fragments occidentals tournent sans cesse autour d'un centre vide, (9). On a réorganisé ces formes dans l'espace mental japonais. 'La stratégie d'Isozaki est l'ironie destructrice et subversive', (5). Isozaki ecrit que son attitude pour MOCA, tait 'schizo-eclectique', (10). Au Mito, en utilisant comme citation quelques prototypes, il semble jouer avec 'la deconstruction' de J. Derrida. Et il dit de renoncer à l'ironie. Au début des années quatre-vingt-dix, Isozaki semble s'interesser à l'image de navir et de mer.

Ici, on peut dire, comme resultat, que l'architecture chez Isozaki n'est pas au sens habituel mais en outre le moyen pour critiquer le vingtième siècle qui est le plus destructeur. La forme de la critique, c'est l'ironie, metaphore. Lors de la catastrophe des bombes atomiques à Hiroshima et à Nagazaki Isozaki avait quatorze ans. Cet événement à du influencer sa conscience et sa manière, d'où son attitude'ironique, destructrice et subversive, (11). Chez Isozaki, architecte devient philosophe, et architecture devient philosophie.

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MODERN WAYS OF URBAN SPACE REFURBISHMENT

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Scientific attempt to create a foundation of theoretical model for restructuring of urban space in poland in accordance with free market economy conditions based on experiences in restructuring Krakow's kazimierz, Poland and Chattanooga, USA.

Period of transition from Communist to free market economy results in great development of mainly small and medium size investment. This investment obviously needs to adopt or erect its own architectural representation in accordance to business profile and all the other limitations /usually insufficient founds for proper interaction with existing architecture/. The process in most cases even if according to the local building code, usually is not well carried out. Proposed business profile as well as the aesthetics are not well proposed. The problem seems to be even greater in centers of big cities, where some regions are over-invested bringing rental rates to ridiculously high values, while others, even in the extremely close neighbourhood and of the big historical meaning, die slowly. Such way of development is ruled by many social and economical conditions unable to be predicted without specific, professional analysis. Therefore the process being unclear and hard to predict brings the great risk for, especially small and medium size, investors.

Based on the above, questions appear, how to reanimate with the PROPER GUIDANCE OF PRIVATE INVESTMENT, "dying" urban spaces and how to preserve their usually great historical character.

The research undertakes scientific exploration of the two most recently published city development plans, from Poland - "Kazimierz Action Plan" and from Tennessee, USA - "Chattanooga Downtown Plan" which allows the close description of them both, along with the comparison emphasising main differences. In conclusion the research provides some general guidelines, a brief theoretical model of urban space restructuring, including problems of ownership and privatisation, the co-operation of different institutions /City Architect's Office, City Hall, local firms and societies/ in creation and enforcement of the successful development plan along with its promotion strategy.

THE SPECIFIC ROLE OF THE DOCTORATE IN THE HISTORY OF ARCHITECTURE WITHIN AN ARCHITECTURE SCHOOL

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A doctoral program in the history of architecture belongs to the more "traditional" post graduate degrees offered by schools of architecture. This can be easily explained by the fact, that this specific program is more palatabile in its scholarly orientation to non-architecturally composed degree confering committees. It could and should be used as a vehicle to introduce further such degrees in schools of architecture.

Parallel with this development, post graduate programs in the History of Architecture can act as an important bridge between various faculties in a University or Technical University:

1. In Universities it fills the important gap between the humanities and the more technical oriented faculties. More specifically its proximity, and yet great divergence from an Art History program can form the methodical link between the traditional humanities approach to architecture, and the very necessary knowledge of an architects background to the understanding of what architecture is.

2. In a Technical University, where architecture forms the link between the humanities outside the university and the other faculties within the university, architectural history should be at the cutting edge of interdisciplinary endeavours.

PRESENTATION OF PROBLEMS FROM HEAVY POLLUTED INDUSTRIAL AREAS IN POLAND FACING THE GROWING NEEDS OF CONSERVATION

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My research work refers to architectural and planning conditions connected with conversion of old buildings especially industrials.

The present paper is an attempt to pay attention to the problem of old industrial buildings which have historical and cultural value. Because their functions have been outlived, they usually are useless and undergo a devastation. Most of them could be used for new applications, since their structure is in a quite good condition and only continuos development of new technologies causes those buildings become low efficient. Modern technologies require new technical and building parameters for industrial buildings. Because of that new uses for post industrial buildings are almost never connected with production purposes. There are not many historical buildings with architectural value in old industrial areas. Ordinarily old buildings or industrial complexes become the symbols of the place identity. They grow into the landscape of towns and open areas and confirm the history and tradition of those areas.

There are many examples of conversion of such industrial centres in Europe The same purpose we have on the area of Upper Silesian Agglomeration in Poland. Industry, mainly exploitation and metallurgy, has been the most important factor of this area development and also development of our country. On the areas surrounding coal-mines, steel works and factories human abodes were arising many years ago. Centrally planned socialist economy created fast industrial development without environment protection. Results of those activities conducted to many ecological, space-planning and health problems.

Presently, after economic and political changes of 1990s some new economic, cultural, social problems appeared. Liquidation of many industrial complexes is connected with conversion of abandoned buildings and areas. This is a really serious, architectural and space-planning problem which I tried present in my paper.

Aims of research:

- doctor's thesis
- presentation of magnitude of conversion, which are needed in Upper Silesian Agglomeration, in Poland
- creation of the systematisation of architectural and planning factors which cause that only some industrial buildings are converted.
- presentation of well done and bad done examples of conversion

Research methods:

- studies of foreign and Polish literature
- studies of archival materials
- visiting of Polish industrial plants which are under liquidation process

Main preliminary conclusions:

- appropriate local policies are to be created in order to activate efficient conversion
- location of the objects (good access to local and international roads as well as railways) is one of the most important issues of conversion
- technical condition of the objects could be also decisive as far as conversion concerned
- emotional factors of people living in the region can influent on decision how to assign new use of old buildings

FORMATION DOCTORALE ET RECHERCHE ARCHITECTURALE EN FRANCE

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La question des doctorats en architecture se pose en France depuis longtemps, depuis la naissance de la recherche architecturale. Mais, aujourd'hui encore, les doctorats en architecture restent une question parce que précisément ils n'existent pas. Pourtant les éléments de réponses qui pourraient leur permettre d'exister sont connus de chacun. La crise institutionnelle que subit actuellement le secteur de l'architecture française, spécialement la réforme en cours de l'enseignement de l'architecture, apporte à l'émergence souhaitée de ces doctorats toute son acuité. En cela, une telle manifestation devient même une opportunité pour affirmer l'urgence d'une véritable politique de formation à la recherche architecturale.

La France est en effet un des rares pays qui a vu se développer une recherche architecturale, pendant 25 ans, sans que ne soit institué un seul doctorat en architecture. Parce qu'éloignés de la culture universitaire, l'enseignement de l'architecture et la recherche architecturale n'ont pas trouvé ce trait d'union qui caractérise tout enseignement supérieur.

Les doctorats en architecture et l'origine du chaînon manquant...

Pour appréhender la généalogie des faits qui ont contribué à l'absence des doctorats en architecture, il faut avant tout souligner l'existence d'un paysage institutionnel complexe, formé au tournant des années 70 et issu des multiples initiatives d'Etat en matière de recherche sur la production du cadre bâti. Retracer les raisons de cette absence, c'est donc, et paradoxalement, analyser les raisons d'une naissance : celle de la "Recherche Architecturale". Mais en 1970, le rapport fondateur pour la mise en place d'une politique de la recherche architecturale, le rapport Lichnerowicz, n'aborde pas le problème des doctorats en architecture parce que les relations avec l'Université sont encore au coeur des dissensions entre l'enseignement de l'architecture et sa propre tutelle administrative.

A l'analyse, on perçoit que cette situation paradoxale concerne presque

uniquement les premières générations d'enseignants de "l'immédiat-après-68". Ces enseignants ont été les acteurs d'une reconstruction de l'enseignement de l'architecture avant même la dissolution du système anti-intellectuel de l'Ecole Nationale Supérieure des Beaux-Arts. Animées par une synergie autodidacte précoce, les premières initiatives de recherche architecturale sont en effet consubstantielles de la restructuration profonde de la formation des architectes.

Enseignement et recherche : entre Equipement, Culture et Université

A plus d'un titre, 1970 est en France une année de transition. Elle consacre une rupture essentielle. Elle met fin à une longue période durant laquelle la production quantitative dans le secteur du bâtiment et des travaux publics a inondé le territoire français. Au cours de cette année charnière, l'Etat s'engage de manière significative vers la recherche. Les dotations budgétaires de la direction de l'Architecture sont alors investies de deux manières différentes. La première orientation de ces crédits de recherche concerne la participation de la direction de l'Architecture au budget d'une nouvelle structure interministérielle, le Plan Construction, très tôt rattachée puis absorbée par l'administration du grand ministère de l'Equipement. La deuxième orientation de ces crédits (plus de cinq fois moins conséquente) donne effectivement naissance à la recherche architecturale telle qu'elle existe aujourd'hui, associée aux différents établissements d'enseignement de l'architecture.

Consacrant malgré tout l'hégémonie permanente de l'innovation technologique sur la pensée architecturale, la conséquence d'un tel partage de compétences est un avortement programmé de la recherche doctorale. En effet, le consensus politique qui donne naissance et légitimité au Plan Construction manifeste une préférence toute pragmatique pour les objectifs opérationnels de la recherche. Il entérine le caractère marginal de la recherche fondamentale en architecture. Il institue dès l'abord une distance entre formes universitaires et formes professionnelles.

Enseignement et recherche : chronique d'un divorce consumé

La mise en place de formations doctorales a toujours été liée aux relations statutaires que l'enseignement de l'architecture aurait pu entretenir avec le système universitaire. Mais la particularité française a instauré depuis l'origine une fracture au sein même des relations entre enseignement de l'architecture

et recherche architecturale. Cette fracture, on l'aura compris, n'est pas tant le fait de distorsions entre les acteurs, enseignants et chercheurs, que celui de véritables incohérences structurelles dans la gestion administrative. Le paradoxe de la situation soulève, dès la fin des années soixante, un décalage extrême entre une dynamique endogène de rénovation de la profession d'architecte et une absence totale de clairvoyance politique. Tandis que les relations entre enseignement et recherche se tissent de manière spontanée dans les Unités Pédagogiques d'Architecture, la distance entre les services du ministère des Affaires Culturelles ne s'amenuise pas, au contraire... De 1968 à 1978, l'administration en charge de l'enseignement de l'architecture n'aura pas de lien structurel avec la direction de l'Architecture.
Aujourd'hui, les tutelles de l'enseignement de l'architecture et de la recherche architecturale s'articulent au sein d'une même entité administrative. Les organes de recherche sont officiellement et structurellement liés aux écoles d'architecture. Mais dans les faits, la recherche architecturale n'est pas un débouché reconnu pour les études d'architecture.

Les doctorats en architecture ou la reconnaissance en devenir...

La mise en place des doctorats en architecture est un enjeu considérable parce qu'il doit d'une part combler ce déficit de transversalité institutionnelle, accumulé pendant 25 années, et d'autre part inscrire dans la maille universitaire l'identité toute particulière de cette recherche architecturale fondamentale. Certes il existe une quantité non négligeable de travaux à portée scientifique relativement limitée. Mais prise dans son ensemble et sur la longue durée, cette production est elle-même la revendication que la pratique architecturale doit reposer sur un savoir. L'avènement des doctorats en architecture, clef de voûte d'un véritable enseignement supérieur, ne sera pas seulement le trait d'union entre enseignement et recherche, il permettra également le renouvellement performant des enseignants qui ont précisément initié cette recherche architecturale, il permettra d'enraciner le statut de ces enseignants et de créer celui des chercheurs eux-mêmes. Les doctorats en architecture pourront permettre à la puissance publique de reconnaître d'une part que les cultures architecturales naissent à partir des richesses de l'enseignement de l'architecture et non plus uniquement des contraintes aléatoires de la commande publique, et d'autre part que ces cultures architecturales sont effectivement la base d'une véritable politique architecturale pour les années futures.

ARCHITECTURAL FRAMEWORK

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This paper deals with a phenomenon, the concept of which I would like to label 'architectural framework'.

In his text 'The Poor Little Rich Man' Loos introduces a rich man who has his architect design his home, its interior design and even his slippers. Loos describes how the man is literally terrorized by the architect's desire to design everything. In the end, he finds himself having less and less space of his own. 1 Loos's polemic is based on moral motives and aimed primarily at the Secession architects although his text can also be understood within a broader context. There are numerous situations, for example, in which it is not only undesirable but even impossible that a designer's hand should control everything.

Design of the built environment takes place at various levels of design. Decisions are taken at the levels of the organization of the city and urban space, the overall configuration of a building, the main supporting structure, the faiades, the access system, and the interior design and furnishings. The requirements a particular level of design has to meet are sometimes contrary to what another level requires; sometimes decisions of a different level are not taken at the same time, in other cases a designer may not be participating at all the levels. It is even more difficult for designers to control the final use and appearance of a building once it is delivered.

When a design with two levels of design (or two parts of a design) 'changes hands' accordingly, it may be necessary to introduce as much architectural separation as possibble. The separation of two levels of design can be realized by using one level as a basis to define a clear framework for the other. The moment this framework has an architectural form or meaning it can be indicated as an architectural framework.

Such an architectural framework can be manifest in many ways. It can be

represented as the screen of a double faìade, or the domino skeleton of the plan libre (Free Plan). Sometimes the framework will adopt a more abstract form, as is the case in the system of building lines and agreements about parcels of land in seventeenth-century Dutch town planning. In all these cases there is a clear framework which allows the designer himself, other designers or the users to act freely without affecting the concept defined by the framework.

DOCTORATES IN DESIGN AND ARCHITECTURE: THE BELGIAN SITUATION

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Firstly, we introduce our lecture by a general overview of the actual situation of architectural education in Belgium. It is quite important to know that Universities as well as Higher Institutes organize architectural studies on an academic level. There are 13 schools of architecture in Belgium, dispersed over six Universities and seven Institutes. The study of architecture is in all this schools a course of five years. The first part of two years leads to the title of Candidate in Architecture at the Institutes, or Candidate Engineer Architect at the Universities; the second part of three years to the Diploma in Architecture at the Institutes or Civil Engineer Architect at the Universities. Actually, doctorates are only deliverd at the Universities. Nevertheless, assistants belonging to Institutes of the Flemish Community have the opportunity to prepare their doctorate during at least 50% of their full time-appointment. For this reason, Institutes and Universities have to collaborate more closely in the future. The second part of the lecture treads the different kinds of doctorates in Architecture. At the Universities, architectural education belongs to the Faculty of Applied Sciences and the doctoral student becomes the title of doctor in Applied Sciences. An alternative way to obtain a doctorate was created for architects, who were trained at Higher Institutes for Architecture. Preliminary to this, they are obliged to follow a special course to obtain a licentiate in Architectural Sciences. After this, they can work on a doctorate and become doctor in Architectural Sciences. Questions about the relation between research and doctorate, and their specific way of financing, are the subjects of the third part of the lecture. On one hand, doctorates can be elaborated totaly isolated from any research programme at the University, on the other hand they can be integrated in shortterm or longterm research programmes. In this case there is a possibility that the candidate makes his scientific or academic career as an independant full time researcher. Mostly, the Belgian National Fund for Scientific Research gives this opportunity to a limitated number of the best graduated. There are also possibilities offered by the Belgian Fund for Collective Research for young researchers to work on

their doctorate during the research period. However, grants of the National Fund for Scientific Research and of the Fund for Collective Fundamental Research are rarely attributed to Architecture. Most of the time, they go to other departments of the Faculty of Applied Sciences, for instance to the Department of Building Construction. There are also possibilities to prepare doctorates in research programmes financed by private enterprises, industries or by the Scientific and Technical Center for Building Construction. Moreover Universities can finance doctorates by their own funds.

The fourth part of the lecture is focussed on the themes and subjects of the doctoral research programmes. Firstly, we will make a survey of the number of doctorates, elaborated from the starting of the Departments of Architecture at the Belgian Universities. Secondly, we will analyse the subjects in relation to the broad field of disciplines in architecture, going from historical subjects to purely technical problems. Thirdly, we will discuss the shifts and evolution in the choice of themes.

A fifth part is dealing with a number of specific stipulations and regulations: which are the conditions for a candidate to be allowed to start and to present his doctorate? Which are the selection criteria for the choice of the subject? How can be organized the supervision of the doctoral work or research? What is the normal duration and is there any link between the time spended to elaborate the doctorate and chosen subject?

Finaly, we analyse the position and the possibilies of a "Doctor in Architecture". What are the specific advantages of obtaining a doctoral thesis for a professional and/or scientific career? Are there any exchanges of doctors or doctoral studenst between Universities? What is the surplus value of doctorates for architectural research and for the progression of architectural science in general?

RESEARCH IN ARCHITECTURE AND THE IDEA OF A SOCIAL SCIENCE

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Sweden has three schools of architecture, each linked to a faculty of technology, in Stockholm, Gotenburg and Lund. Each school has a rather extensive research and research education program. About 150 research students participate in the research education programs at the three schools. A research student who is studying fulltime is supposed to finish his studies within 4 years, a goal that very seldom is achieved.

Royal Institute of Technology, Stockholm: The department of Architecture and Urban Design is divided into 9 divisions, one for each research education subject: History of Architecture, Building Design, Building Function Analysis, Design Methodology, Theory of Form, Architecture, Building Engineering, Lightning, Urban Design. The department has a staff of about 90 people, including 9 full professors, 9 lecturers, and about 40 researchers/teachers. Most of the external funding comes from the Swedish Council for Building Research and similar state or private owned sources. The school has about 450 undergraduate students and about 50 postgraduate (research) students. The annual output of the research education program is about 4 to 5 doctors of technology (after 4 years of study and an accepted dissertation), and 4 to 5 licentiates of architecture.

Chalmers University of Technology, Gothenburg: The School of Architecture is divided into 8 divisions, one for each research education subject: History of Architecture, Building Design, Housing Design, Industrial Building Design, Design Methodology, Theory of Form, Architecture, Building Engineering, and Urban Design. The school has about the same size and organisation as the school in Stockholm.

Lund University of Technology, Lund: The school of architecture is divided into 8 divisions, one for each subject: history of architecture, building and design in third world countries, building function analysis, building design,

theory of form, archtecture, building engineering, and urban design. The school has about the same size and organisation as the school in Stockholm.

The architectural research ecducation system in Sweden now has been practiced for nearly 30 years, and the result have not been very staisfactory. The system is expensive, inefficient, and is troubled by several problems of quality both when it comes to the methods used and the results presented.

The main reason for this is, the author of this paper proposes, that the architectural research education system already from the start did the mistake of taking over methods and other intellectual tools from the established social sciences and of applying these tools in the field of architecture and urgan design, without any reflection on the specific character of the problems of architectural and urban design. The results have -not always, but much too often - been something that might be labelled as second class sociology instead of first class architectural research. One way of discussing these very fundamental problems of research methodology in a *practice-oriented research field* like architectural and urban design is presented by the english philosopher Peter Winch. Therefore, a discussion and a short summary of his most important ideas are given in the paper.

The paper presents the ideas of Peter Winch regarding the interpretation and understanding of the meaning of het life forms and the forms of practice that constitute society, as expressed in his book *The idea of a Social Science*. Winch outlines a general research programme for the social sciences, using form of life as the key concept. Other important concepts like *rule*, praxis and language game are given their meaning by the key concept of form *of life*.

In the paper it is argued that these ideas have certain implications for the architectural research process: how architectural research ought to be structured, and how the aims and goals of architectural research ought to be defined. The paper proposes that the fundamental questions of architectural research are conceptual, which means that every research project in this field must be related to the key question of what architectrue really is. The fundamental concepts of architecture must be analyzed *a priori*. Before the researcher starts his empirical research, he should define what the research project is all about. Every architectural research project should aim, it is argued, at providing a unique and situation determined answer to the question of what architecture really *is*.

The different aspect os architecture *-form, function and structure* - are supposed to merge into just one perspective, that views the building as a *limited but meaningful whole,* but the understanding of the whole presupposes a discussion of questions that are conceptual, not empirical.

This perspective has some very important theoretical and practical implications for the development of methods for architectural research. It demands that the clarification of architectural concepts should be considered as the kernel of architectural research, and the paper therefore concludes that the overall aim of architectural research should *be the articulation of the practice of architecture.*

Keywords: Architecture, Social Science, Interpretation, Concept, Rule, Family Resemblance, Language Game, Form of Life, Practice, Meaningful Whole.

AESTHETICS - THE LOGIC OF THE SENSES

An examination of order in cultural symbol systems with particular reference to architecture.

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This paper argues that it is the aesthetic 'order' of cultural symbol systems that facilitates cultural communication, and not as has been formerly accepted, the shared meaning of symbols. It goes on to argue that such order deriving from the same root as logic, displays the structure of logic. Thus the paper will show that the order or aesthetic of the cultural symbol systems can be understood as the 'logic of the senses', which in ancient Greek, is the original meaning of the word 'aesthetic'.

Cultural symbol systems include the arts and sciences, mathematics and architecture. Each of these systems can be described as a network of interrelated symbols. Each symbol carries meaning for the individual perceiving it, but this meaning is dependent upon their previous experiences. Such experiential backgrounds are different for each person; thus it is realised that each individual will have their own meanings for cultural symbols. Since the meanings of symbols are not shared, it is argued that meaning cannot be the vehicle of cultural communication. The paper argues that the common ground that allows cultural communication are the symbols and the relationships between the symbols. Organisation thus becomes important.

Organisation, we learn from Gestalt psychology, is an innate function of the nervous system. The outside world, which at the level of sensory stimuli alone is read as a buzzing confusion, is given an order by the nervous systems of the individual perceivers. The nervous system not only senses the outside world, but it orders the information that it receives. The orderliness that an individual experiences is thus a product of their own nervous system; it is determined by the characteristics of their senses, and their mental functions. Such mental organisation is based on the principle of organised 'wholes', or Gestalt, and these Gestalt give rise to mental symbols. Such mental symbols enable humans to conceive their world.

Now the organisation to which we refer manifests certain consistent characteristics. Organised forms represent a state of equilibrium or repose,

and such states are defined by the reversibility of the relationships in the balance. In terms of mental operations, this phenomenon is described as logic or rational thinking, and in this paper we point out how this same logical structure purveys each of the cultural systems. It should be emphasised, however, that this understanding of logic or rationality is an extension to the traditional use of the words, and though including the traditional interpretation, now encompasses a much broader field.

Rationality and logic, as used in this paper describe the basic organising structure of the system itself. The traditional use of these words describes the way that ideas are related, the use of 'rationality' or 'logic' in this paper also describe the ways that forms are related; be they musical, poetic, sculptural or architectural. The eye and the ear are used to create these forms, quite naturally the eye and ear must be used to interpret them. Distinct from the traditional use of the term, the rationality of music and the visual arts might thus be described as the rationality of the ear and eye respectively.

Such logical processes have determined the way the various contributions within a particular symbol system are related. The symbol-systems themselves thus manifest a particular logical order. This logical arrangement of the various symbol systems we describe as the systems orderliness, architectural and aesthetic order fall into this category.

Hence, it becomes possible to understand how using reversible relationships of equivalence, similarity, symmetry, metaphor, or the balancing of opposites, an individual can be led, through a series of rigorous relationships (be they consciously understood, as in the case of mathematics or physics, or intuitively experienced in the case of art, architecture and music), from the earliest cultural works through to the most recent cultural contributions.

Thus the paper is able to explain the paradox of everyday experience. It is able to explain how cultural 'order' allowed communication to take place, whilst simultaneously allowing each individual to have their own meaning for the symbols they perceived. Cultural 'order' enables each individual's depth of meaning to be extended, whilst at the same time allowing them a unique view of the world. Cultural and aesthetic order makes the same experiences available to all, it serves to unite society whilst allowing personal meanings to exist. CulturaL aesthetic order thus explains individuality in the midst of unity.

"ARCHITECTURAL EDUCATION AND REALITY"

"Transmission of Knowledge in the Design Studio, in relation to teaching methods and architectural concept formation.

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This research thesis addresses the means by which transmission of architectural knowledge in design studio is developed on a conceptual and contextual level (organising principles of architecture, philosophy of design, architectural language). The transmission of knowlege in the studio is mainly implicit. The aim of the research is to find and reveal, through the analysis of verbal transmission, the components and contents of design language and the way these relate to each other. It is focusing on the underlying developments that take place on a pedagogical level i.e. on the use of different teaching methods and the consequences of those on the studio transmission level.

The research happened in two distinctly different cronological periods. It coinsided with a shift in architectural education that took place between the late eighties and early nineties in London.Two different schools of architecture were chosen for the research, the Bartlett School of Archilecture, UCL London and the School of Architecture and Landscape, Greenwich University London. Both case studies focused on first and third year projects briefs and reviews (reviews were chosen for their quality of being verbally explicit)

A multilayered text analysis was used which advanced from a simple content classification to a meaning classification and anebled the text to be decomposed and reveal its hidden structures. The research started by examining the content (design domains) of the discourse and the form of the context in which knowledge is transmitted and received, its density. The classification of the discourse followed where the sequential, associative relationships (syntagm) between the design domains were examined.The verbal expression of the discourse set up the 'themes'and the rules which described the development of each individual project . Finally the structure of

the discourse (system) delt with relationships of functional contrast. It offered an insight to the design language development between the first and the third year of architectural studies and concept formation.

This research argues that the visibility of the transmission of architectural knowledge in the studio, which is due part to the fact that is taking place mainly on a visual level, is influenced only by the presence of an explicit teaching method. Transmission is not becoming more or less visible as the years go by, but depends on the idiosincratic structure of every academic year and project.

Design domains (the main components of design language) are transmitted visually or conceptualy and not in both levels simultaneously. The plane of associative spatial relationships (syntagm) is the one of visual connections including fragments of background knowledge within it. The plane of relationships of functional contrast is the one that sets up the conditions and rules for the project, most of which are metaphoric. Both levels interact to create architectural concepts. The presence of rules and conditions is the same throughout the architectural educational discourse, which proves that from day one the students are forced to conceptualise. Their initial hypothesis or starting point for the project goes through transformations as the students are setting up new rules up to the final formulation of their proposition. First year decisions are simple involving few design domains around them, while as the studies advance students tend to involve more domains in setting up more complex rules.

The architectural discourse is complex and multi-layered. Its structure becomes more complex through the academic years but not necessarily more visible as the aquisition of architectural knowledge takes place on the level of concept formation .

It has two modes of operation endostructural/metaphoric and exostructrural/metonymic. The first one relates to the internal structure of architecture and the second one to its extended relational context. Background knowledge is framing both syntagm (visual) and system (conceptual) and plays a very important role in architectural cognition. The structure of any background knowledge can be violated leading to the formation of new design rules, to the 'foregrounding'. The paper argues that possibly 'Fouregrounding' is of metonymic mode in architecture.

DOCTORATES IN DESIGN? WHY WE NEED A RESEARCH CULTURE IN DESIGN.

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The development of research through design in the School of Architecture and the Built Environment at the University of Humberside is being informed by the need to participate in a transnational movement to establish a research culture in the professional practice of design. This movement recognizes that the continued health and influence of the design discipline requires the establishment of a position of strength in relation to disciplines such as management, economics, social science, planning, engineering, etc. each of which derives its credibility with the policy makers if not always its efficacy in practice from rigorous and well presented research. Therefore, although 'new knowledge' is, one hopes, the outcome of a research programme, the main reason for developing and continuing in a particular research culture is to share in the influence one's discipline gains over the direction of human affairs. In this sense the development of a research culture is not primarily about advancing knowledge, it is about power.

In design we have a peculiar problem: generally design does not communicate anything important through its end products. The things, places, messages and systems which are the outcomes of implementing designs normally are not readily interpretable as generalized knowledge. Designed objects are generally speaking poor vehicles for the communication of useful information about the world even to most designers never mind to politicians, executives, technologists, and academics. The knowledge that is embodied in a designed object forms only the tip of a potential iceberg of insight . To recover what is beneath the inscrutable surface of the designed object one must allow the design process itself to speak and in the same operation one must facilitate the recovery of the programmatic and philosophical dimensions of design. This requirement involves a sea change in the way that design as a practice is viewed by practitioners. It requires the acquisition of a research orientation during training - an early initiation into a discipline-specific research culture.

Culture is not a straightforward concept as anyone who has encountered Zygmunt Bauman's analysis will know. (BAUMAN, 1973) But certain aspects of the designer's experience in existential as much as in social terms reveal the fragmentation and uncertainty of the practitioner's condition. Design knowledge, as expressed competences, is hard won. A succession of master-apprentice relationships is the making of most designers whilst for some a more isolated struggle set against the background of an unforeseeable succession of design opportunities characterizes their personal development. Traditionally little comes to the designer by way of an openly accessible accumulation of design knowledge. Designers have tended to avoid recording the intricate relationship between the design process and its outcomes and reflecting upon the experience of designing in terms of the knowledge it generates of the world. Only infrequently are means sought to produce a transferable knowledge - that rare exhibition that tells the story of a design project, that rare publication that systematizes the knowledge of extensive experience. Most design knowledge dies with the designer. Only when designers believe in and value - and practice as a duty - the systematic documentation and evaluation of designing will things change. What has already changed is that through the recent proliferation of postgraduate design courses and the address of conferences such as this - we have already had: Design Renaissance, Glasgow 1993; Embodied Knowledge and Virtual Space, London 1995, and; 4-D Dynamics, Leicester, 1995 - expectations have been raised, and numerous groups in universities and in professional practice have begun developing methodologies and establishing values for the future of design as a research practice.

To be hopelessly simplistic about it, science is concerned with discovering how things are, the humanities with discovering what things can mean. Design is distinctive, it is concerned with how things could or ought to be. It has, therefore, the greatest potential for a worthwhile influence on political, economic and cultural realities. Unlike craft, design addresses radical material change: unlike art it must address the interests of others. Bound into the very notion of design is the necessity of an engagement with the complexity of the human situation in the world. Design is not only the great synthesizer of knowledges, it constructs its own peculiarly polyvalent knowledge which makes visible and realizable the possibility of change. Designers are the natural inheritors of interdisciplinarity and, therefore, of the postmodern boom in multidisciplinary research. To make this a reality, however, they need to be at the core of a research culture, able to decide who is admitted to design

research programmes and who not. This provides the only hope of organizing the essential multidisciplinarity in the face of already powerful research-based cultures in the sciences and the humanities.

Conclusion:

Like it or not, design is in the marketplace of ideas. (ADORNO, 1966) Without its own core of powerful, intellectual leaders active in investigating through design the direction of future material culture and committed to articulating, communicating and advocating design knowledge, design will suffer technological and political instrumentalization, academic mythologizing, and perhaps oblivion.

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DESIGNING GREENSTRUCTURES AND DEVELOPMENT OF NATURE IN DUTCH METROPOLITAN AREAS

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Abstract

People living in cities want nature areas and outdoor space within easy reach. In the absence of a 'genuine' wilderness half-natural ecosystems are developed. The more the Randstad in the Netherlands becomes a metropolis, the more nature is worshipped. What is called nature is in fact a human artefact. Nature areas, city skylines, open spaces, lanes and vistas dissect the urban landscape and connects its parts. Nature commands respect, not just in representative outdoor spaces, but also as wilderness. Greenstructures provide a framework in the landscape and contribute to the contact between city and nature.

Introduction

Outdoor spaces and natural areas are valued as the counterparts of the city. The open landscape is very popular with those looking for the rhythm of the seasons or a sunset on the horizon. In a time when the western part of the Netherlands is integrating into a metropolitan area(Taverne 1994), woods and bushes are being planted on a large scale. Rough and empty areas are supposed to imitate 'wilderness'. If possible, semi-natural ecosystems are maintained as parts of the man-made landscapes. 'Wild' species however die out on a large scale because of intensive land use. The land dries up and the intersection of waterways and roads splits it up. In the decades to come there are plans for 150 thousand hectares of scrub, where nature is allowed to have its way (Bink et al 1994). In addition space must be created for a million new houses (van Dijk 1994) and hundreds of kilometres of railroads and motorways (Provoost 1995).

USING TELEMATICS FOR THE BENEFIT OF AN URBAN AGGLOMERATION

a scientific design for Haaglanden (NL) for 2025

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We are on the threshold to a new world: the informational society. The use of computers and telecommunication (telematics) in the informational society will have great influence on and possibilities for the urban agglomeration. In this summary the analyses for the design of two spatial scenarios for the urban agglomeration Haaglanden towards the year 2025 is presented. In both scenarios telematics are widely implemented with a view to substitution of motorized traffic and so reducing congestion and pollution.

Before making new plans existing plans have been studied. Three plans: "Streekplan Zuid-Holland West", "Zuidvleugel-Randstad" and "Haaglanden", and also the existing situation in 1994, will be "remapped" on the same scale and with the same legend. This remapping makes the plans comparable. Also the situation in 1965 is analyzed. Looking back thirty years and analyzing the spatial dynamics of the built-up area, the density, population, services (work, shops) and traffic flows, will help us to look forwards a same period of thirty years. Figure 1 shows us the situation in 1965, the current situation and a spatial outline for 2015 made by the Province Zuid-Holland. The urban areas are black, the glasshouses are gray and the unbuilt-on areas (nature, recreation, water, agriculture) are white.

We see that the towns and villages in the agglomeration are growing but that the total population stays equal and the population in the main center (The Hague, Rijswijk, Voorburg, Leidschendam) is declining. In other words the population is spread out over the area. This deconcentration partly explains the grows of the mobility (and the congestion). Also the amount of open land (nature, recreation, water, agriculture) per person is declining. So on one hand we see that the city is emptying and on the other hand we see that the countryside is vanishing.

Can we use telematics to stop this undesirable developments? With two scenarios we will explore the possibilities. In both scenarios telematics will be introduced widely. With teleworking, teleshopping, telelearning,

videoconference, telebanking, teleinformation; telematics in transportsystems and so on it is possible to create a new spatial organization of an urban agglomeration.

In Scenario A telematics are used to concentrate urban functions (work, education a.s.o.) to the small scale of the pre-industrial society. The diameter of the daily urban system is roundabout 5 kilometers. In Scenario B telematics are used to bring a lot of 'outdoor'-activities to the home. This will lead to an 'urban' sprawl of residential areas. Both scenarios will be developed and checked on their ecological, technical (traffic performance) and social effects.

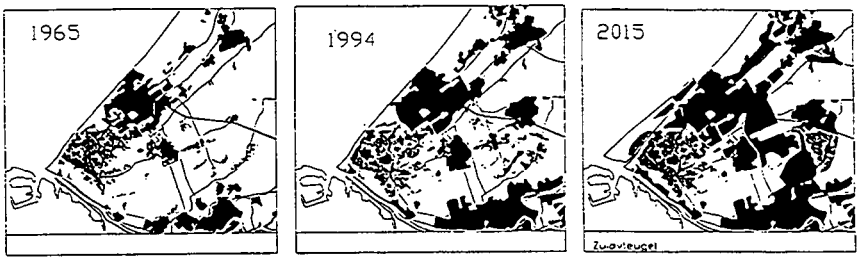

Figure 1: Haaglanden in 1965, 1995 and 2015

	1965	1995	2015
Population	915,000	913,000	
Population in center	710,000 (78%)	560,000 (61%)	
Built-up area	113 ha (29%)	181 ha (43%)	266 ha (59%)
Roads	45 km	62 km	>72 km
Railroads	56 km	71 km	>74 km
Density (pers./ha)	74	50	
Unbuilt-on	320 m2/pers.	260 m2/pers.	
Mobility NL (/pers/day)	28 km (1978)	37 km	

AT THE OUTER FRINGES OF CONVENTIONS

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Statement

- Ph..D students gain considerably from going at least once through the exercise of establishing the state of the art, formulating a hypothesis, verifying it and going back to the literature.
- Educational institutions enrich their research potential through the presence of doctorates.

This evidence should not obscure a certain number of problems:

- The most talented designers are hardly interested in making a doctorate.
  Similarly the best design-teachers seldom conduct doctorates
- The doctorate is not valorising for getting employment in architectural practice. On the contrary offices distrust those who kept away from 'getting theis hands dirty" through experience.
- With the exception of Mediterranean, Near- and Middle Eastern countries the doctorate does not even help in getting academic positions as design teachers (still the central issue is schools of architecture). It is more important to demonstrate high quality design than theoretical performance.
- Studenst in archtecture are badly prepared for scientific research and writing.
- A majority of doctorates in architecture could just as well have been conducted in a neighbouring faculty: art history, anthropology, sociology, gegraphy, etc.

Questions

1) Are there thesis subjects which would have been impossible in a faculty other than architecture?
2) Does the formal presentation of a doctorate necessarily have to be an argumentation through text?

i.e. Could the media be other such as formulas, graphic charts, paintaings, a building, etc.

i.e. Would F.L. Wright;s Robie house, Le Corbuisier's villa Savoie or John Hejduk's drawings for houses A, B and C deserve a doctorate?

I shall show some slides of a thesis which consisted of 24 paintings and their legends accepted at the EPFL in 1981.

The state of the doctorate in architecture in Switzerland

During the last part of my presentation I shall briefly present the spread of subjects and the conditions for doctorates at the two Federal Institutes of Technology in Switzerland (ETHZ and EPFL).

PROPOSAL FOR A NATIONAL ACADEMY OF ARCHITECTURAL SCIENCE

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This proposed new National Academy of Architectural Sciences will offer advanced students the opportunity to earn a professionally oriented Doctorate level degree. The objective is not to duplicate existing PhD programs, which are academic and research oriented, but instead to create a new kind of professional degree for architects, similar to the M.D. and J.D. degrees in medicine and law.

Rather than attempt to build a new free-standing university and try to recruit a high quality permanent faculty, the Academy can instantly create a world-class faculty by establishing a network among the senior people who teach building science in all the schools of architecture in North America. This 'inter-campus university' will take advantage of the latest technology in distance learning and electronic communication to bring together this highly specialized group of teachers and their students.

A student, to be admitted, must already be enrolled in a Masters Program in an accredited school of architecture. A member of the faculty at the home institution will serve as the applicant's academic mentor. Thus every school of architecture can offer its best graduate students a chance to participate in a nationally administered Doctorate Program while they remain and work within their home institution.

Qualifying exams will be structured like a set of national Design Competitions, each testing the integration of some aspect of building science in the context of an architectural design problem. The Academy Jury will evaluate the architectural quality of the solution, as well as its technical excellence, and the successful integration of the two. This insures that applicants have learned the basics of design and building science in their first professional degree program.

Dissertations must expand our knowledge in Architectural Science and demonstrate its successful application to an actual design project in a way that produces a measurably improved solution. Dissertation committees will contain at least two faculty members from other campuses around the country.

The Annual Convocation serves as the setting where final dissertation defenses will be presented before the Board of Regents and the assembled National Faculty. When the work is accepted, the diploma can be signed by any of the Faculty and Regents who wish to add their names. Thus, in a tangible sense the value of the degree granted by the Academy is the value of all the names of the people who sign it.

Our objective is to graduate our first class in the Year 2000!

"CONTINUITÀ" AND CRISES: THE THEORETICAL AND DESIGN APPROACH OF ERNESTO NATHAN ROGERS IN THE ARCHITECTURAL POST-WAR DEBATE

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This work is part of a research project titled " Precedent and Innovation in Post-War Italian architecture", that is being carried out under the supervision of prof. Alexander Tzonis (DKS- group), Faculty of Architecture, TU Delft.

The research examines the role of belief-systems and precedent knowledge in design innovation, in relation to the work of the Italian architect Ernesto Nathan Rogers (1909-1969).

The relevance of Rogers' role, mostly in the post-war debate, can be determined through the analysis of his theoretical elaborations closely connected to the architectural activities of the BBPR office (Banfi, Belgioioso, Peressuti, Rogers) from 1932 till 1969. Rogers as director of "Domus" (1946-1947) and "Casabella- Continuitê " (1953-1964), as a member of the main comitee of the CIAM from 1945 to 1958, and with his University teachings in Italy and in other countries, was one of the main "actors" in the linguistic and conceptual reform of post-war modern architecture.

He tried to develop a theoretical and operative method which gave new conceptual values to the relationship between the use of history in modern design; at the same time his theory of "continuity" of moderne architecture represented a fundamental ideological attempt to link the rigid paradygm of Modernism with the etherogeneity of differing cultural contexts.

The richness of Rogers' intellectual background, BBPR's activities, and the important historical phase: from late Fascism to the Second World War, and then, from the European reconstruction, to the economic "boom", all give us the possibility to study in depth a relationship between the evolution of a individual research and the role in collective events.

Rogers' "micro-history" becomes an important opportunity to investigate the relationship between individual ideology and mass culture. It tried to focus on the connections between crises and continuity in the elaboration of new meanings, and to study the dialogical interaction between the members of the BBPR office in order to generate design concepts.

Moving from a cognitive approach to the "case", the research tries to focus

on the evolution of Rogers' reasoning process in relation to the continuity of his work as a designer and a theoretician, whilst simultaniously examining closely the role and the value of crises as the cause of a change in consciousness.

Rogers' "continuity", seen through his double experience in "Casabella-Continuitê" and BBPR's activities, can be studied as an ideological elaboration clearly linked with the cultural and political background of the '50s.

Simultaneously I started to develop an epistemological revaluation in the use of sources, focusing on the role of Archives in modern architectural offices.

The growing complexity of the architectural practice has generated in the last century a quantitative evolution of firms' archives: drawings, models, photographs, personal and official letters, technical documentation and magazines have become the core of modern archives, and one of the main sources for a non-formalistic approach to the history of contemporary architecture.

An indepth research into BBPR's Archive provides the opportunity to focus on the evolution of the Rogers' process of theoretical and design reasoning, and to analyze the progress of his single projects.

I consider design mainly as a product of a conflictual relationship between individual intuition and collective accordance. The study of a large series of the documents (visual and written) permits the precise reconstruction of the various cultural, social and economic components which contributed to the realization of building.

Historical research in the evolution of an individual theoretical structure could be used to determine the basic components in elaborating a model of analysis on the strategies that generate design concepts.

Three case studies (the monument of the war-victim-Milano, 1945, the building in via Borgonuovo-Milano, 1947, and the BBPR correspondances between 1943 and 1949) will be used to illustrate a methodological approach, and the state of my research.

HISTOIRE ET ARCHITECTURE EN FRANCE

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On sait que l'enseignement de l'architecture, en France, est resté en dehors de l'Université, une situation que renforce le récent rattachement des Ecoles d'architecture au ministère de la Culture. De ce point de vue, comme discipline scientifique, l'histoire de l'architecture est une forte relation avec l'université: en effet, il y a en France une tradition de l'histoire universitaire de l'architecture, puisque c'est l'Université qui a fomé depuis la première guerre mondiale la plupart des spécialistes français de premier plan en histoire de l'architecture. Pour l'antiquité (Picard, Martin), pour le Moyen-Age européen (Focillon, Baltrusaitis, Grodecki), pour les Temps Modernes (Chastel), l'archéologie et l'histoire de l'art ont foumi un cadre à un développement de l'histoire de l'architecture. Et le grand chantier de l'inventaire national, cet instrument de la connaissance et de la protection du patrimoine, né il y a trente ans, a largement puisé ses forces dans l'Université.

Dans la période récente, les intérêts scientifiques pour le territoire de l'architecture ont dépassé, comme chacun sait, le cadre initial de l'histoire de l'art. Depuis les années soixante, poussée par l'évolution rapide de la culture urbaine et par la fragilité reconnue de nos villes, l'Université s'est fortement investie dans l'étude du cadre bâti, qui est entré alors dans le champ des sciences humaines. Dans la phase récente, à côte de la sociologie (Moulin), de l'anthropologie urbaine (Lefebvre), et de l'histoire urbaine (Choay, Roncayolo), l'histoire de l'architecture est en train de reprendre une grande place. Dans les sciences humaines, les historiens ont admis, à la suite de Norbert Elias, la portée des constructions dans les enjeux matériels et idéologiques d'une histoire sociale. Les historiens "structuralistes" ont renouvelé les approches, permettant une meilleure lecture des pratiques sociales à l'oeuvre dans l'archtitecture. Les historiens "technologues" ont enfin trouvé, dans l'histoire de la pensée constructive, le chemin d'une heureuse réhabilita tion de la pensée technique. Dans une population scientifique en renouvellement rapide, où les frontières disciplinaires s'estompent, ces

composantes de la recherche hisorique, à l'Université, au CNRS et à l'EHESS, contiennent aujourd'hui les principales activités de la recherche scientifique en histoire de l'architecture.

Depuis les années soixante dix, les architectes, soucieux de mettre en valeur la complexité de leurs interventions, ont multiplié les analyses des formes historiques du bâti. L'élargissement rapide des intérêts pour la protection du patimoine, souvent en dehors des limites traditoinnelles de l'architecture monumentale, a montré la nécessité de fonder ces pratiques sur un approfondissement des savours; l'histoire de l'architecture pénètre dans les musées et dans les institutions de la Culture. Les besoins de la formation en histoire de l'architecture se précisent dans les métiers du Patrimoine et dans les interventions des architectes.

Pour toutes ces raisons, l'histoire de l'architecture est devenue un nouvel enjeu pour les formations universitaires, pour répondre à la fois aux problématiques récentes de la recherche historique, et aux besoins de la formation dans les milieux professionnels concernés, en particulier pour les métiers de la culture et de l'architecture.

Dans cette problématique d'une recherche interdisciplinaire, la préparation au doctorat en Histoire de l'architecture doit aujourd'hui passer par la collaboration de l'Univeristé avec les autres institutions, comme l'Ecole Nationale des Ponts et Chaussées (ENPC) , le Centre National de la Recherche Scientifique (CNRS), l'Ecole des Hautes Etudes en Sciences Sociales (EHESS), et les Ecoles d'architecture (EA). Ce projet a permis à plusieurs spécialistes de créer à l'Unversité de Paris I en octobre 1993 le Diplôme d'Etudes approfondies (DEA) en Histoire de l'architecture moderne et contemporaine. Ce DEA est le premier niveau des études de la formation doctorale.

Pendant l'année de DEA, l'étudiant est conduit à formuler son projet de thèse: il doit ê ce moment préciser les sources documentaires et la bibliographie, et fixer les limites du sujet. Le DEA a été délivré en 1994-1994 à 19 étudiants, en 1994-1995 à 26 étudiants. La promotion actuelle comporte 32 inscrits.

La Plupart des sujets de thèse portent sur l'histoire de l'architecture en France et en Europe (Allemagne, Italie, Finlande, Russie). Ils s'étendent de façon ponctuelle à l'architecture des pays non-européens (Chine. Brésil).

Les questions traitent surtout du XXC siècle; à côté de questions sur la

modernité classique (1920-1940). l'accent est mis sur les années depuis 1945, et en particulier sur:

- les partenaires de la commande (commanditaires, architectes)
- les principaux programmes de l'architecture publique et privée.
- les espaces aménagés (la ville, le jardin, le paysage historique), l'art urbain.
- les techniques de construction, l'apport des ingénieurs et des entreprises:
- les procédures de la communication: l'image, la critique.
- la pénétration local de l'actualité de la construction et de l'architecture.
- les pratiques de la commande.
- les institutions de l'architecture, les practiques professionnelles.

DOCTORATES IN ARCHITECTURE - ARCHITECTURE IN DOCTORATES

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Architecture as a discipline needs a stronger intellectual basis to survive the actual societal changes. Therefore we need research and doctorates as the highest emanations of research.

Doctorates are by definition pushing the actual limits of science forward.They can explore in depth one aspect of architecture and/or bring together knowledge from related disciplines into a new synthesis in architecture. In terms of methodology much can be learned from an historical investigation (diachronic) as well as from a structuralistic reading (synchronic) of the built environment. Typical for architecture is the designerly way of looking at reality. Knowing for doing. Reality however is not very favorable to scientific research in architecture. It is not very well organised, representation in research granting committees is week, the mentality in architecture has allways been directed towards designing a new world and in the same line of thinking towards (re-)inventing new theories; this results in a manifest lack of cumulative knowledge. In many schools theoretical courses are weak because they are not considered as being important. Outsiders even do not know what is architectural theory.

Doctorates and the requirement of doctoral degrees for teachers, or a significant part of them, should improve the quality of theory in architectural teaching.

Being at the same time science and art, can architecture be caught in doctorates? Can the scientific approach unravel the essence of architecture? Yes, provided we respect the categories that discriminate scientific writing from other texts. Architecture, as part of the real world, has anyhow to do with values. These values and the underlying value system have to be made explicit in order to produce a scientific discourse. Given the complex nature of architecture, we need a multitude of readings for grasping the essence of architecture: epistemological, phenomenological, semantic, technical, social, morphological, typological etc. Every doctorate has to profile itself clearly as to

what aspects of reality it is addressing itself and make clear what is the underlying value system. Poetic discourses on architecture are an essential part of the debate, but they have no place in doctorates. Now that mechanisation has taken command and that mechanisation of the brain has started, architecture needs more than ever consertation on doctoral research instead of sprawling it over countless institutions.

COMMUNICATING DESIGN - JOINTLY CREATING VALUES

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I propose and seek to confirm theoretically a broadening of the design theory by including the design communication. This because it influences the design and consists of structures similar to those of design.

Thomas (1978) claims that communication is design combined with interpretation, and used as a method of problem solving.

There are several types of design communication: predesign negotiations, internal discourses, presentation and negotiation with external professionals and decision-makers, and ultimately confrontation with the public, and criticism by laymen and professional communities.

Considering the inevitability of communicating design, and the influence it has - in the words of Schoen (1983); reframing and changing the design - it seems appropiate to include communication into the theory of design.

In accordance with this view, in an interdisciplinary approach, we can trace aspects relevant for this broadened view, and by inductive reasoning find implications for the understanding of the process and the outcome of it.

The focal point is the moment of transformation, from a mainly visual concept to a verbalized one. Reversed, we have a situation of analysis and interpretation of the verbal discurse, transforming it back into a visual concept. These processes show similarities with those described by several authors in the field of design theory (Schoen 1983, Darke 1984).

Organisational studies have produced research results showing that the human communication and understanding have structural limitations (Doerner 1989).

The problem of interdisciplinary communication has gathered interest. Schlump (1990) says that communication has developed towards largely differentiated subsystems - specialized in their own branch in order to be efficient. At the same time these subsystems have become selective and unabel to communicate across their own subsystems borders.

According to cognitive psychology, understanding is constructed on the basis of previous knowledge (Driver 1990) - in the case of discussing architecture - the counterparts knowledge of architectural theories. Due to this, and faced with the fact that communication is coloured by the goals of the participants (Adler et al.1995), the moments of communicating design are critical and levelled to non-architectural viewpoints, like that of the developer, the user and the builder. In the field of marketing, the idea of jointly created values, all parts co-operating to create mutually satisfying results - though with differing goals - has been established as an efficient strategy for negotiation for agreements (Lax & Sebenius 1986).

Our understanding is based on conceptualization (Eyseneck 1990). Architectural drawings representing visual concepts, while verbal concepts are presupposed in a communication, architects are faced with the task of verbalizing design concepts. Seeking approval and understanding, the most appropiate way is to adapt the communication style to the one of the listeners.

This brings the architect into the remarkable situation of designing according to sofisticated architechtural theories, but communicating and promoting the design as a simplified verbal concept, understandable to laymen.

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HOW BUILDINGS CAN BE TAILOR-MADE

- Title PhD research: Processes of product development in the building Industry -

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To achieve a better grip on every aspect of appearance for your project as an architect, it is advisable to posses a better understanding about the processes for new product development. Most architects, however, choose to have a rather passive attitude when it comes to materialise their designs.

If architects are interested in designing a tailor-made building for their customers, why not make that special product which completes the conceptual image of the project. The techniques of doing so at acceptable costs are there: simultaneous engineering, on-line connection-possibilities with manufacturers, calculation and visualisation techniques on computers all help to shorten the lead-time. They are just waiting to be used.

The architect has to discover that the manufacturer is not just a retailer where the only possibility one has, is to purchase what is in the catalogue. The manufacturer has knowledge about what is possible with his production equipment and what is not. And he is able to give an estimation of the costs, and the ways how to reduce them. Therefore he can be seen as an advisor, like a structural engineer. If we draw this parallel a little further, we realise that in order to be able to communicate on an equal basis the architect has to have some basic knowledge about the processes of product development.

Firstly the most important thing is not to know how methods and techniques can be described in general terms, like for example; methods of organising product development and techniques for creativity, financial and quality control. An essential requirement is knowledge of the different kinds of processes involved in the evolution from idea to product and when in these processes specific methods and techniques can be useful. This does not mean that obtaining insight in methods and techniques is a waste of energy, because it is not. The point is, that processes and tasks involved do not change over the years, while methods will. And as an architect you may not

have the time to keep up with all the latest possibilities. This is where the manufacturer might be helpful.

Secondly one should be able to distinguish the archetypal forms of an organisation for the processes of product development. For example the difference between a serial and a parallel development process. Archetypes can help in order to be able to position a specific process.

Finally one has to be aware of the different roles that people can have in this. Who is going to design the product, for example, the architect or the manufacturer? Or is a form of co-operation a better solution?

Still today, not a lot is known of the specific characteristic of the processes of product development in the building industry. To generate a theoretical knowledge of these processes one does not need to invent theories from scratch. In other industries a lot of research has been done and a lot can be learned from them. More practical this is done through comparing the processes for generating new components for buildings with those used for new components for cars, trains, boots, satellites and televisions. With distinguishing parallels and differences for the different products the characteristics of the processes of product development for building components becomes clearer, and new strategies for the building industry may evolve from this.

Equipped with a basic knowledge of the processes of product development the architect will be in a better position to orchestrate the process the way he wants.

HOUSE OF THE MECHANICAL MUSES - A MUSEUM OF THE TECHNOLOGY AND THE HISTORY OF THE POLYTECNIC SCHOOL IN TORINO

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The research investigates some of the problems connected with the design of a museum that wants to become on one side a rapresentative part of the city as a building but at the same time that could tell the story of the city itself. A so considered industrial town as Torino is living all the contradictions connected with the changes of the fourth industrial revolution. In its last two hundred years history Torino is impossible to be described and to be seen without the development and the growth of the industries. At the same time only the improvement of the school and the scientific research institutions with the Politecnic school as one of the most important, could explain the reached results.

In many parts of the world new museums are increasing theyr importance becoming a sort of social and not only cultural focal point for the city life to refer to. The museum as a "laical cathedral" coming from the Nineteen Century tradition is transforming itself in a place where is possible to meet a new form of art, or if we want, a new form of intellectual activity: " the art of Memory ". We may also consider Memory as an autonomous entity able to create in the so colled collective mind a resistence against any change attempt, or in others words able to create a protected area for men and women that want to connect themself to the inner meaning of the zeitgeist they are living in. This means that a museum is not anymore a place where you go to visit a collection of objects trying to tell you a story but is a place in wich you can look for a story or better where you create your own story being interactive with the space, the colour, the sound and all the elements you meet. A museum dedicated to the history of the technology and the science is a place where you learn to see from another point of view the world surrounding you. It must be a place in wich you can see, for istance, a refrigerator not only as a mass-produced article, (for this is enough any museum of contemporary art) but also as a re-engaged history of the cold.

The design of a building able to give and not to take away meaning from the endless series of objects apparently banal, but with a deep influence on

everyman life and the possibility to find in it the meaning of the too fast to be understood changes that technology makes in our life is the goal of the research.

The approach used to the problem was in these two years a wide exploration of all the different languages used by man not directly involved with the theory of the architectural design in defining the work of the architects. The translation of these ideas into forms and volumes understandable for everybody is a matter connected with the so called "art of memory". To investigate this abstract but real existing collective mind is a way of trying to know the deeper desires of people and to give answer to the increasing demand of meaning in the way of living in our wold. Comes to the mind the rewritten Cartesio sentence about life , not anymore " Cogito ergo sum " (I think, therefore I am), but " Memini, ergo sum "

(I remember, therefore I am).

ART THEORY AND CULTURAL STUDIES AS A BRIDGE BETWEEN ARCHITECTURAL AND URBAN RESEARCH

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Combining architectural and urban research has long been problematic because of the attitudes of researchers as well as of the incommensurability of methods and points of view in different disciplines. Not much easier has it been to combine architectural education with any kind of research. All but immediately operationalisable knowledge has often been considered futile. As a researcher of architecture and urbanism and as a teacher of both Master as doctoral degree students I have tried to find connections between different fields of research and between research and education in order to increase the self-reflectiveness of these.

The postmodern discourse of the late 1980's seemed to offer an outstanding possibility to create communication between different disciplinary discourses. The notion of a postmodern culture of signification brought a common denominator into the discussion. The interest of sociologists in cultural studies brought them close to art and cultural theory. Traditional art and cultural theory again could gain by the analyses of cultural sociologists of the cultural production in explaining the role of art and culture in the present society.

The example taken into consideration here is the theme of avant garde. To the second and third year students of the history of urban culture, the theme is illuminated through analysing the emergence of modern urban architecture. Later, in the urban planning studio the fourth year students try avant garde and experimentalism as possible forms of intervention in designing the 1990's suburban renewal. The object area given to the students is a post-WWII modernist suburb that in its present form is an example of the variants of modernist avant garde. The framework in which it is now supposed to be solved is a national suburban renewal programme, recently redefined in the spirit of sustainable development, which again means trends to make existing areas denser.

The same area is a research object in a multidisciplinary research project in which the problems are the social and cultural preconditions of making the existing suburbs denser. The post-WWII suburbs have in Finland become a national garden city landscape, interventions into which are by no means unproblematic. The attitudes of the population differ from those of the state administration. The state administration has with various research results proved that it undeniably is technically and economically advatageous to make the existing areas denser. To the inhabitants, however, the areas have significant symbolic value in their present state, in a close contact with nature.

To the young researcher studying the cultural landscape the problem of postmodern cultural production is familiar from her advanced Master studies in which she made a study of the postmodern discourse. The acquaintance with one theoretical discourse makes it easier for her to enter the world of research and to meet other disciplines. Her present task is to construe a theoretical framework for the research procedure including the participation of citizen and planning experts. The procedure shall in a simple way simulate the actual processes of cultural production. It will lead to the next phase of the research project.

In the interdisciplinary research discussion and in the interaction between research and education, the characteristics of modern and postmodern urban landscape are analysed. The specific position of the object area as a representative of modernist 'state architecture' which is also supposed to be renewed as a kind of reformist 'state architecture' is considered a modernist parallel to the spontaneous postmodern landscape formations.

The forms of intervention, avant garde and experimentalism, are problematised. The history of avant garde is studied as well in the sense of the preconditions of avant garde as in the sense of the specific problematique of the relations between art and life, presented by the historical avant garde. The preconditions of cultural production in the phase of modernism are compared to those prevailing in the postmodern phase. The change of the 'from art to life' trend into the postmodern trend 'from life to art', that the theorists of the postmodern call the stylisation of life, is studied.

The production of symbolic landscape is studied at various levels. It is studied at the levels of artistic, intellectual and academic fields where canons are established. It is also studied in a broader cultural framework, where the

production, circulation and dissemination of symbolic goods take place within power-balancies and interdependencies between different social groups. Last, it is studied at the level of everyday practices, where the regimes of signification are used. To understand the landscape and the role of intellectuals in its formation it is necessary to look at the level of both lifestyles and city cultures, and at the level of changes in the social structures and relationships that dispose the cultural specialists and intermediaries.

The analyses of cultural production tend to make the students aware of the many sides of their future role as intellectuals. In the research process the question is actualised by the expectations on communicative planning, which in its simple form of direct democracy case by case does not obviously meet the demands of fully mastering the complex processes of the production of urban art.

The results from experimenting with interactive processes between research and education show that the students' awareness of their choices in design studios grows. They also more easily choose their readings from the sphere of research. For the doctoral studies a previous acquaintance with theoretical discourses is an obvious advantage. The preparedness to discuss with researchers from other fields as well as the ability to formulate one's own research questions are better.

LA RECHERCHE SUR LA CONCEPTION ARCHITECTURALE : ENTRE CHAMP ET DISCIPLINES.

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En France, la plupart des champs de la recherche architecturale emprunte aux disciplines existantes leurs points de vue sinon leurs méthodes : histoire, sociologie, sciences physiques, informatique etc..La question des doctorats est alors épistémologiquement simple - même si institutionnellement elle peut être plus compliquée - car ces doctorats d'histoire, de sociologie, d'accoustique ou d'informatique appliqués à l'architecture peuvent être considérés comme des cas particuliers de doctorats existants à l'Université et peuvent être menés en co-habilitation avec ceux-ci.

La conception architecturale constitue un champ de recherche original dont rendent compte colloques, publications et numéros de revues spécialisées. La particularité de ce champ est qu'il se construit autour d'une "idée neuve" : la conception, selon J.L. Le Moigne, à la suite d'H. Simon , idée qui nécessite de repenser non seulement les découpages disciplinaires, mais encore son assise épistémologique .

Toutefois la conception architecturale en tant que champ de recherche rassemble aujourd'hui des objets de recherche divers : la morphologie architecturale (Equipe de B. Deloche, P. Denis, B. Duprat), les systèmes d'acteurs, les savoirs de l'action (Cressac) , l'espace de conception comme espace d'opérations (Architecturologie), la matière d'oeuvre du projet (A. Renier) etc...

Pour qu'une discipline existe il convient que les divers objets scientifiques qui la constitue soient construits au sein d'une cohérence épistémologique. C'est cette cohérence épistémologique qui autorise également une stratégie d'enseignement. Force est de constater que l'hétérogénéité des objets de recherche aujourd'hui désignés par l'étiquette "conception architecturale" rend une telle cohérence épistémologique globalement difficile.

Il convient donc d'identifier les cohérences épistémologiques pour

envisager la ou les disciplines permettant d'investiguer le champ "conception architecturale". Une fois de telles cohérences posées, on peut envisager recherche scientifique, enseignement constitué, et par conséquent filière doctorale. Il semble donc que la conception architecturale en tant que champ puisse donner lieu à plusieurs filières doctorales.

Par conséquent, il convient de parler de doctorats en architecture au pluriel , dont les objets émaneraient soit des diverses disciplines qui font de l'architecture un domaine d'application privilégié, soit de disciplines nouvelles, non représentées à l'Université, qui permettraient d'investiguer le champ de la conception architecturale. Cependant, ce n'est pas parce qu'un thème, voire un champ est absent du découpage disciplinaire institué par l'Université qu'il se constitue automatiquement en discipline potentielle.

L'Architecturologie s'est préoccupée de définir ses objets au sein d'une cohérence épistémologique qui participe du paradigme constructiviste. Elle constitue d'emblée une hypothèse de voie doctorale. Elle pourrait également avoir vocation à fédérer la diversité des productions de connaissances issues des sciences de la conception, au regard du champ architectural pris comme domaine d'application.

Enfin, il apparaît que c'est à partir d'un positionnement épistémologique clair que peuvent être envisagées des coopérations interdisciplinaires. Nous évoquerons l'exemple d'une recherche à l'interface architecturologie/ informatique qui a visé à rendre compatible modélisation théorique de la conception architecturale et modélisation informatique de l'approche par objet. Une telle recherche qui vise à rendre tangible la part de conception présente dans le C de CAO, suppose qu'une collaboration soit menée à partir de chacun des domaines concernés sans rabattre l'un sur l'autre, ce à quoi procèdent trop souvent les recherches qui tendent à calquer la formalisation de la conception architecturale sur la formalisation informatique. En terme de formation doctorale, la coopération de disciplines différentes sur un objet objet commun tel que la CAO doit donner lieu à un programme de formation original qui se distingue d'un programme propre à une discipline.

THE BRITISH DOCTORATE IN DESIGN AND ARCHITECTURE

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Until recently the British doctorate in Design and Architecture has been the conventional Doctor of Philosophy - Ph.D or P.Phil. Under pressures from industry and government a new British doctoral programme has been developed, similar in nature to the D.Ing., and known as an Eng.D. or Doctor of Engineering. This has led some British universities to begin the preparation of taught doctoral programmes in the American style. To our knowledge no such doctorates presently operate in the UK. Funding for full time doctorate studies in Design and Architecture is mainly from the Research Councils, and by a few grant in aid trusts, such as Wolkfson and Leverhulme. The extremely popular part time mode of study is normally funded from the postgraduates' companies and by the students themselves. Most doctoral candidates have to have a British honours degree at the 2.1 level to be funded to undertake research with the onus normally on the student to find a supervisor and funding. Supervision is extremely patchy in the UK with students typically receiving less help than they would like, particularly in broadening studies and its aspects of creativity. Exchanges between overseas universities are becoming common, as are shared responsibility between British universities for joint supervision. At present there are no specifi professional career possibilities for those holding a 'doctorate in Design and Architecture", except within academia, where career progress and salary are often accelerated for members of academic staff holding a doctorate.

PUBLIC URBAN OPEN SPACE IN NORTH AMERICAN CITY CENTERS

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In large metropolitan areas, the value of urban space has always been recognized by society, although its quantity, form and function have varied with time and place.

The open spaces in a city are a reflection of the state of the society and of the complexities of social life. They are an expression of public opinion and of political action, an indicator of social growth and change, and a source of information. Social experience in cities is gained through finding satisfaction and pleasure in relationships with other people, carried out in public open spaces. Open space is where public life occurs.

Thus looking at cities and public urban life, the role of open space needs reconsideration. The city is a collage of numerous built structures and diverse open spaces. The study of late 20th-century city centers in the North American context can be synthesized into the particular experience of five types of open spaces which are predominant in urban environments today.

First, there is the defined, enclosed space, the designed or over-designed plazza, which interprets urban open space as a rare and precious commodity. It celebates itself; it is exclusive and one-dimensional in terms of how and by whom it is used.

The second and largest one is the street, almost one third of our cities is comprised of streets. They are mainly associated with congestion, pollution, danger, waiting in traffic, pushing through crowds.

The third one is the highly specialized, yet single-purpose, backyard-like open space - the parking lot. It is the indicator of today's egocentric, enecological behaviour of irresponsible, atomistic individuals, using, sealing, violating, polluting common open space.

The fourth type, the park, has always been assigned a high value as a

public amenity. But the design of the late 20th-century formal park such as the ethnic garden or the architectural park governs the users' behaviour and does not allow an informal and spontaneaous use.

The fifth is the void, vacant land not yet developed, but used informally. Vagrants and homeless people find their temporaty homes under freeways, in forgotten, leftover, unoccupied spaces. This interim use of vacant city space defines and specializes it for the sole use of one group socially segregated from society.

According to this analysis, there is hardly any network of similar multi-use open spaces but a combination of specialized places, which have in most cases been reduced to its technical function. They are not open to local action or improvisation, and they do not encourage imaginative use. Open spaces today are missing one essential quality - accessibility. The city is separated into functional units, and so are the open spaces. The fragmentation of the city parallels the inability of open spaces to be the focus of city centers and the alienation from public life. Social satisfaction, meaning that which attracts people most in a city, i.e. other people, cannot be achieved in public open space. ⓘpen spaces in North American city centers today are a location of individual experience, not of social congregation, in fact, they are even closed to the public at large.

RESEARCH IN TEACHING ARCHITECTURAL DESIGN - BETWEEN EMPIRICISM AND SCIENCE

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A research in teaching design involves mainly two disciplines: pedagogy and architecture (architectural design). Until now most of the efforts aimed the design area: generatory concepts, design methodology; this research proved that exists a wide specter of approaches, from those which believe in the existence of scientific design methods, to those which stress the importance of the creative- self. To overcome this obstacle, a new path to study in teaching design should consider not only the concept design, but especially the couple design and pedagogy. It should deal with the specificity of this relation that lies in the communication student- professor. This one selects a content (which he considers to be relevant) and conceives also the means to internalize it, the ways to stimulate the student to manipulate them consciously and the ways to assist him in his action. So, one of the problems seems to be that of organizing formative messages and educational hypotheses and of developing them into educational models.

An educational model in design is always incomplete, dynamic, according to the real educational situation (and, thus, being influenced by the interaction with the student's world). This leads us to the immediate difficulties that a research in teaching architectural design will face, a research trying to transpose implicite or explicite design strategies into educational models: the complexity of the research object (design - an opened concept), the re-definition of the pedagogical concepts in terms of design (educational objective, content, structure of learning and so on), the bringing together of the architectural and of the pedagogical logic, the formulation of the evaluation criteria of the proposed model a.s.o.

RESEARCH IN TECHNICAL, ECONOMICAL AND CULTURAL EFFECTS OF SUSTAINABLE BUILDING

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According to Wiek Röling Dutch architecture is deteriorating (Röling, 1992). Part of this deterioration relates to the severe effects on the environment caused by architecture.

The basis of this research is the assumption that the development of architecture can be helped by introducing sustainable building methods as integral part of building technology and design.

To formulate my hypothesis more precisely I postulated three research hypothesis:

1. sustainable building is not merely a technical problem
2. the structural obstructions for Sustainable Building can be overcome by proper legislative and economical adjustments,
3. the cultural effects of sustainable building should be investigated more thouroughly before introducing this concept into society om a larger scale.

To facilitate my research I borrowed parts of theories from architectural design research in the field of environmental planning and ecology by Prof.Dr.ir Taeke M. De Jong from the Delft University of Technology and from the theoretical work in the field of Appropriate Technology (AT) of Prof.ir Willem Riedijk from Vienna University of Technology in Austria.

The conditional definitions of architecture in terms of the function, building structure and form defined by Taeke de Jong (de Jong, 1992) are linked to the trialectic relation within technology development defined by Prof.ir Willem Riedijk (Riedijk, 1988). With the interrelated definition of technology, existing of a technical, structural and a cultural axe I can relate the technical description of architecture with development processes in society.

Scientific research methodology for technical effects of sustainable building.

I designed and built three extremely sustainable dwellings in The Netherlands and an office building in Germany. These buildings are a practical proof that Sustainable Building is technically feasible.

Secondly I executed technical research in the three aspects of architecture function, building structure and form. Starting with the three pillars of the Dutch National Environmental Policy (NEP):

- energy conservation;
- integral chain management;
- quality improvement;

I design ecological improvements on the structure of buildings. Then I will report about the changes in function and form of the building.

The first pillar includes the execution of energy calculations, which proves that the goals of the Dutch National Environmental Policy (NEP) can be reached within existing technical solutions easily.

In the second pillar of integral cycle management I will alternate some existing dwellings to prove that with existing technologies ecological building is technical feasible. As a third step, within the pillar of quality improvement, I will show through technical research that with all these alterations the physical comfort of the houses will improve and threats for human health can be controlled and minimised.

Scientific research methodology for structural effects of sustainable building

The organisation of our society contains legislative, economical obstructions still blocking a successful introduction of Sustainable Building methods. Especially the economical feasibility seems to be an important factor.

In 1990 I already showed that the existing Dutch Building Code, although not designed to support Sustainable Building, is not obstructing diffusion of sustainable Building.

Uncertainty about used technologies and price consequences of these technologies are the main reasons for principals, contractors and architects not to get involved. My practical field research shows that these uncertainties are due to the inaccuracy of the architects work in drawing and designing. The so called economic feasibility has little to do with building, but more with administration and emotional arguments used by the principal and the contractor.

If sustainable building is not merely a technical problem, and organisational problems will be overcome, the question still remains if sustainable building techniques are going to change the significance of architecture?

In the field of sustainability as well as in architecture there is a lack of appropriate research methodology. This research shows that the tradition of research within architectural sciences can be developed very easily unto an appropriate scientific level (Meijdam, Ravesloot 1995). The technical feasibility of sustainable building is no problem, economical and structural obstructions can be overcome by simple administrative changes. Cultural effects of sustainable architecture however have to be researched carefully, before launching sustainable architecture on a larger scale.

FOLLY OR FOLIE: EXCAVATING THE GRAVEL PIT IN SEARCH OF AN AUTHENTIC DESIGN PROCESS

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Introduction

Architect and environmental sculptor, Thomas Spiegelhalter, notes that in an age increasingly defined by cybernetics and virtual reality that there exists a corresponding counter position that suggests a need for visual-haptic-olfactory experiences. Recalling the Merzbau total environments of Kurt Schwitters, Spiegelhalter's environmental sculpture affords design process strategies for interpreting contexts. His design process analogy is that of "Gravel Pit Architecture" which, as noted by Stephan Berg, consists of flexible, fragmentary parts of scaffolding, where nothing is static or final, which from the inception are laid out for their final demolition and, in turn, produce no result but only raw material for further operations. The architectural setting, like the gravel pit, changes shape through the work of the excavator.

Since April 1993, my design studios have explored the duality of the significant urban artifacts, city/museum and street/gallery in the context of a design proposal for The Regional Cultural Center for the Study of Human Migration, located in the immigrant quarter of Luxembourg's third largest city. The cultural center consists of a decentralized exhibition program that links an existing, working train station and gallery space to a collection of site-specific, decentralized "Folie" spaces that contain exhibition and active, culturally based programs.

Research Objectives

The research and design studio activity explore environmental sculpture as seen in Spiegelhalter's BERYL A project and the Merzbau project of Kurt Schwitters as urban interpretive strategies, analytical tools and design process methods aimed at discovering appropriate architectural form, order, materiality and spatial content aware of its respective setting. Topography, urban and industrial fragments, architectural elements, light and technology are interwoven in the design process to realize, in the context of the aforementioned cultural center case study, a series of "Folies," or human

scaled, sensually responsive spaces that seek to invite human interaction. Beryl A and Merzbau offer insights towards creating an authentic, site specific design vocabulary that seeks not to become an end in itself but to reveal "site" and serve as the raw material for future operations.

Research and Design Method

Analyzed in terms of the conceptual lens of the *urban artifact,* the city, through the construct of the theory of urban artifacts, can be discussed in terms of its most fundamental constituent element. Aldo Rossi has written in *The Architecture of the City,* that the urban artifact "implies not just a physical thing in the city, but all of its history, geography, structure, and connection with the general life of the city."

The design studio investigated how Schwitters' Merzbau design process could be implemented to understand the relationship between gallery and city as an interpretive tool for expressing the nature of the *urban artifacts* specific to the immigrant quarter at the scale of environmental sculpture within the train station gallery and at the scale of the decentralized folie exhibition spaces within the *Quartier.* Schwitters' artistic production modes of Merzbilder and Merzbau were filtered through the related and technologically current Beryl A environmental sculpture project of Thomas Spiegelhalter in order to formulate design criteria for the decentralized exhibition spaces or urban *Folies* (Fig. 2) attuned to the exigencies of a continually fast changing environment.

After their initial immersion into the fabric of the immigrant quarter, the studio began to examine the physical, architectural and urban structure considering material fragments that could be "foregrounded" as part of an urban exhibition promenade throughout the Quartier. The street became the urban gallery; The *Folies* the setting for the active exhibition encounter. Design issues were elucidated in the form of emotive drawings (Stimmungs-bilder) (Fig. 1) that expressed the material and sensual qualities of the place in terms of space, light, profile, contour, silhouette and the relationship of built structures to the land. Upon completion of the emotive drawings, the studio created small, largely recycled, material assemblages(Merzbilder) that expressed the site issues experientially in terms of material indication and juxtaposition. Environmental scale sculpture studies(Merzbau) reflected the spatial qualities of the urban artifacts that they had explored in their emotive drawings and Merzbilder and served as the basis for the spatial content of the

decentralized *Folie* space pavilions (Fig. 2) and the permanent exhibition space within the existing train station.

Preliminary Conclusions

The design process of Emotive Drawing (Stimmungsbilder), Assemblage (Merzbilder) and Environmental Sculpture (Merzbau) offers an experiential component to normative architecture and urban design process strategies often characterized only by building and spatial typologies, morphological study and the analysis of precedent. The sensual qualities of the site are often not considered in the design process limiting the potential development of a site specific architectural vocabulary. The studio continues to explore experiential, analytical design process strategies that seek not to become an end in themselves but to reveal "site" and serve as the raw material for future operations.

Fig. 1

Fig. 2

L'APPRENTISSAGE DU PROJET COMME LIEU D'OBSERVATION

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Enseigner le projet revient à assumer la complexité et la variété des questions posées par la conception architecturale dont la connaissance peut s'enrichir d'une connaissance des processus de son apprentissage. Intriquant tout à la fois un savoir spécifique (une connaissance de la conception architecturale, pour moi l'architecturologie), des savoirs extérieurs au domaine de la conception stricto sensu et une formation à l'action - nécessitant outils multiples et capacités variées, l'apprentissage de l'activité de conception suppose des découpages, et, partant, sa didactique peut être différemment orientée : fondée sur l'acquisition d'une connaissance et/ou sur un apprentissage en faisant.

La notion d'obstacle, en ce qu'elle permet d'éclairer les processus d'acquisition de connaissances et de savoir-faire, est un levier pour tester les acquis de la recherche, en validant ou invalidant certaines propositions théoriques sur le processus de conception.

Dans le corpus que constituent les productions d'étudiants, qu'ils soient en situation d'exercices ou en situation de production de projet, apparaissent des procédures de réalisation de tâches (un étudiant en architecture produit toujours quelque chose), à la fois réflexives et pragmatiques, qui montrent comment des connaissances locales (1) peuvent être efficaces, y compris dans le cadre de la modélisation théorique de référence..

Relevant du fonctionnement cognitif de l'apprenant, elles correspondent à des habitus mentaux (représentations, modélisations erronées ?) dont l'organisation est suffisamment forte et pertinente dans les situations considérées, mais qu'il s'agit de déplacer dans un processus global de construction de compétences.

L'étude des conditions de l'enseignement de la conception architecturale

permet, du côté étudiant, de distribuer les obstacles rencontrés soit par rapport à des procédures mémorisées, soit par rapport à des expériences antérieures qui mettent en oeuvre des représentations, soit encore par rapport à des connaissances préalables, mais d'autres obstacles relèvent du contrat didactique mis en place.

(1) J'emprunte cette notion à Léonard et Sackur - "Connaissances locales et triple approche, une méthodologie de recherche" in Recherches en Didactique des Mathématiques, vol. 10, nr. 2/3, Grenoble, 1990 -

AN OVERVIEW OF DOCTORAL DISSERTATION CONCENTRATIONS AND PROGRAMS IN ARCHITECTURE AND DESIGN IN THE UNITED STATES

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Compared to other disciplines, doctoral programs in architecture and design in the United States are relatively recentdevelopments, with the first doctoral degree being granted in the 1940's at Harvard University. Since then, the growth of doctorates in this general field has been modest, although on the upswing over the last 20 years. Presently, there are approximately 17 Ph.D and Doctor of Design programs in the United States offered in architectures schools althoug doctoral dissertations which concentratie on architecture and related topies have been completed at a wide range of colleges and universities both with and without architecture schools.

If one is to understand the organization and direction(s) of research in the field of architecture and design in the United States one place to look is at the categories and distribution of architecture dissertations which have been completed. Such data give clues as to both the range and focus of research in these fields and reveals temporal and geographic patterns and trends. The number and concentration of graduates also reveal apparent changes in market demands and preferences.

This paper reports University of Florida research on doctoral dissertations completed between 1974-1988, based upon paper titles and abstracts as categorized by the University of Michigan's University Microfilms International. It also reports recent research completed at the Georgia Institute of Technology which looks at the size and organization of doctoral programs at architecture colleges in the United States. The paper ends by raising questions about the growth, organization, direction, funding, and market potential of US doctoral programs in architecture.

DISSERTATION? "THE PROCESS OF STRATIFICATION IN THE WORK OF CARLO SCARPA"

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Theme: Analysis of the stratification-principle in the work of Carlo Scarpa. Examination of the historical roots of this method and research of the spacial and formal effects.

1. Stratification as a morphological principle in architecture:

Stratification as a principle of material arrangement is part of the nature of construction and is among the normal requirements of a building. In architecture it is necessary to have different layers or strata in the construction as protection against rain, sun and changes in temperature.

The term "stratification" is normally used in the tecnical description of facades. The two-layered facade or the cavity-wall is an example of the resolution of an element according to his various functions. Only the whole complex of a wall-construction can be physically flexible and is able to endure different climatic situations, to create and limitate space and to satisfy visual requirements.

Apart from that the method of stratification is able to integrate different time-levels in one building. This makes possible the existance of different stiles and periods in one complex without distroying or disturbing each other. (e.g. restauration of old buildings)

Variability by stratification" can not only be applied to technical areas, but also to the creation of space and the division into different zones.

Apart from all these material aspects of stratification one can find a level of association in architecture, which is reminiscent of historical traditions and creates a certain poetry of symbolic significance which I would call the ?association-layer".

2. Stratification in History

"I am a Byzantine at heart, and in Hoffmann you will find something of an Oriental too: like a European looking towards the Orient." Carlo Scarpa is an architect of high culture and a profound historical education. He knows about the historical periods of architecture and often uses hidden indications of historical, especially byzantine motives and themes.

The analysis of Greek, Roman, Byzantine and Islamic architecture shows that stratification is no invention of twentieth-century architects. Often one can find the traditional division into a construction level and a decoration level, that can transport religious or other contents.

The theorists of the end of the 19th. century tried to find out a new interpretation of architecture in their discussion of polycromy in ancient architecture. The fact that ancient architecture was no monolitic structure, but was made of different "layers" as stone,stucco and colour is the beginning of an new interpretation of architecture.

The principle of clothing of Gottfried Semper defines the roots of architecture as structure and ?carpet". Architectural elements has to be treated like textile objects surrounded by forms like seams and special joints. The cover of the construction changed from textile to stone, but the treatment of the panels remained the same. The treatment of wall-panels and floor constructions a.o. in the work of Carlo Scarpa show elements of the theory of Gottfried Semper.

3. Tendencies

According to his own words Scarpa was deeply impressed by different tendencies of architecture. The de Stijl-movement, the Secession of Vienna and the estetic culture of Japan were very important directions that use the additional principle of stratification. Architects likeLe Corbusier and Frank Lloyd Wright influenced Scarpa especially at the beginning of his architectural carrier.

4. "Stratification" in the work of Carlo Scarpa

Carlo Scarpa (1906-1978) is an architect whose development draws on deep roots in the Veneto-region and on traditional forms and construction methods. The phenomenom that I would like to examine is the transformation of normal stratification into a principle of design as visible in Scarpa's projects. "In choosing Venice as his spiritual home, Scarpa affirmed his identity as magister ludi of fragmentary architecture. In this type of architecture the possibilities of innovation and invention reside in the building elements and in the manipulation of the visual and kinesic relationships among the vaious fragments and artefacts. Hence this architecture is the product of the resolution, substitution and design of elements, whereas technology, with its double faced role as techne and logos and logos of techne, forms the basis for an understanding of the interplay of elements and in the dialogue set up among thmen by theis replacement in the fabric of the building."

He transforms a primarily tecnical principle into a design-instrument, that is very flexible and contains many possibilities of formal development of architectural elements.

During his architectural development, the significance of stratification increased gradually and became part of his morphological thinking. He developped his own rules how to treat the layers of a building (facade, floor and ceiling).

The possible effects of stratification in architecture as a system of different layers can be defined as:

1. The formulation and definition of space, the dynamisation of existing rooms and environments.
2. The integration of a new layer into an existing building and context without destroying the ancient or older structures. This is a method for integrating his own formal ideas into the exisiting complex.
3. The solution of tecnical requirements that can demand the division of facade-elements into various layers with different functions.
4. The transport of associations that refer to traditions and symbols, and contain information reminding us of possible historical buildings or situations.

Scarpa also uses layers as a method to envelop a structure, to be able to use it as a basis for presenting objects of art.

2.3 Analisy of examples:

- Castelvecchio, Verone; (1958-1966); Example for a structural reversion and restoration of a medioeval complex and the integration of a museum-use.
- Calleria Querini Stampalia, Venice, (1961-1963); restoration of the ground-floor of an old Venetian palace and integration of a short garden.
  Use as gallerie, exibition space. Example for the resolution of the floor into different layers.
- Banca Popolare, Verona (1973-1978): new building in a historical context; Example for the reslution of a facade structure into layers.

3. Methods of research

The idea of process is to use the computer as a presentation-tool and to use the specific possibilities of this instrument in combination with traditional research methods like photography and drafting.

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ARCHITECTURE AS ARCHITECTURE AND TEMPORALITY

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Why?

The proclamation - philosophic - of the "end of the modernity" reached also in architecture a replica of its success, if not alike a theoretical and conceptual production - which is a condition for a praxis - at least as a linguistic operation, simply transformed in a practice.

The production - the necessity - of philosophy was put in doubt by the perspective of the evolution, ad infinitum, of knowledge. The determinism and the rigor of scientific knowledge judged it self as a matrix for the young social sciences elevating them as powerful instruments of world's understanding.

The informational revolution makes superlative that way of understanding. The structure replaced the conjuncture, the synchronic analysis overpasses the diachronic analysis.

At the same time the Nature, Social and Human Sciences make the epistemology of its speech, reveling the proper incongruence. Philosophical thinking recovers and search, from its side, new conditions to its legitimization and to what it legitimates.

Architecture and its theory requests after the sixties the conquering again of a new autonomy: the return from the interdisciplinary to disciplinary, the rejection of the analysis and of the methodologies, the value of design, the apology of context refusing the model, it could be said - they said it - Architecture as Art.

Feeling it self as an orphan, periclitating, putting it self as minor knowledge amongst other knowledge's, disbeliever of it proper idiosyncrasy, Architecture is taken of by a challenge that only from far away belonged to it.

What Science discovered was the existence of a limit behind the limit, an impossibility in the shadow of any new possibility. So the needing of a new narration, for the making of a proper legitimization.

The same Architecture made, forgiving that it was not a Science. Proclaiming the new law, of the disciplinary autonomy and plurality, set

dangerously near political legitimization and philosophical legitimization. Considering, from this last side, that what temporality (the times) said was that everything is possible that legitimization was a self-sufficient one, misgiving the argument between architecture and temporality, by the subjugation of the knowledge of architecture (knowledge) by the temporality of architecture (reality). For the Author it is the relation between interior time and exterior time that, in case, is played.

What?

The research is about author's job, the authorship. In this matter the process intends transcend not only the modern substantial use of the knowledge (as a single way) but also the post-modern circumstantial presence of the reality (as a single way). The Author does not exist, a priori, neither in the body of knowledge nor in the body of reality. The Author becomes from a function (architecture) and that function becomes from the connection of the two bodies: knowledge and reality. So, the Author is a living organism and, as that way, each connection between a knowledge and a reality (architecture and temporality) give life to a different Author, that produces a different work.

The means (in case an architectural language) is never a starting point, an a priori (as like in the traditional modern way where, progressively, all the finalities become predetermined by the operational means that subsist, misunderstanding the different circumstances in presence), but always an ending point, an a posteriori, where that construction is the specific result of a complex process of co-relation between the two bodies, in attention to the intended finality.

For research the knowledge is thought as Science, Art and Social Science; the reality is knew as Nature, Culture and Society. The process exists as explication, communication and comprehension.

DESIGNING LIVING RIVERS IN AN URBANIZING LANDSCAPE

The landscape architecture of the Dutch river area

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Research period: August 1994 - August 1999

The landscape in the river area will be subject to heavy changes in the near future, due to e.g. nature development, dike reinforcement and urbanization. Therefore it is surprising that relatively few attention is being paid to the landscaping of these developments: could they be fitted into the existing river landscape in such a way that they increase its formal quality?

One of the characteristics of a river area are the dynamics of 'living rivers', which create habitats for many organisms as well as an experience of nature for man. In the past river management was merely directed towards restricting river dynamics, but at the moment it tends to offer more opportunities for the expression of river dynamics.

The central issue in this thesis-study is how a landscape architect can deal with the relationship between form and natural dynamics in the river landscape. More in particular, this landscape-architectural study aims to discover and examine tools and concepts for the design of urbanization and nature development in the river landscape. The object of the study is the landscape in the river area along the branches of the Rhine and the Meuse in the Netherlands.

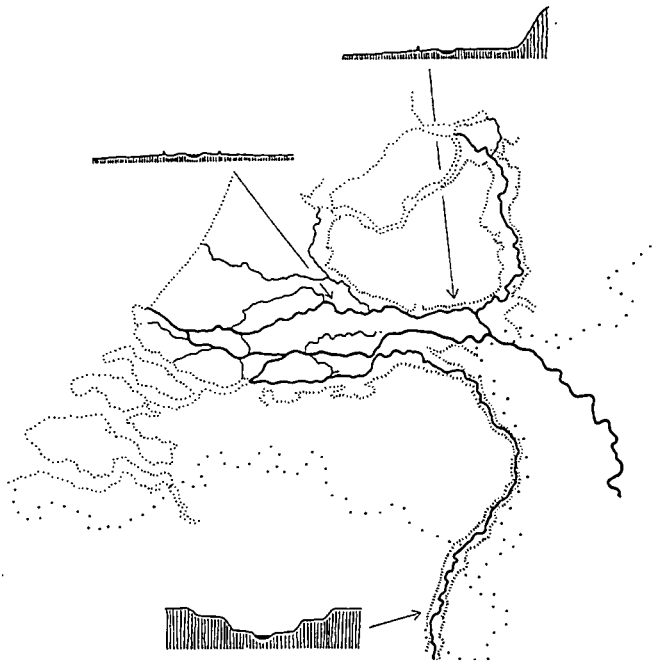
Several research methods will be used in the study, which combines an analytical phase and a design phase. The analytical phase is supposed to result in a formal typology of the river landscape and in a catalogue of design tools and principles, related to certain types of river stretches. This phase comprises a literature search, a formal analysis of the Dutch river landscape, and a formal analysis of several plans for the river landscape.

The design phase is meant for examination and evaluation of the tools and concepts in different situations. It includes the formulation of scenarios for nature development and urbanization, as well as design experiments for some river stretches, starting from different scenarios.

At this moment some (preliminary) conclusions can be drawn on the typology of the river landscape. The river landscape is considered as being composed of three layers: the natural landscape, the man-made landscape and the urban landscape; the latter are transformations of the former. The formal and dynamic characteristics of each layer can be ordered by four aspects: form of the river valley, form of the river, morphological dynamics (related to erosion and sedimentation), and hydrological dynamics (related to high and low discharge). On the scale of the Netherlands the river stretch is the primary typological unity. The landscape-architectural type consists of (the transformations of) the form and dynamics of a river stretch.

In addition to the typology of river stretches a number of marked points can be distinguished. In most cases it concerns a meeting-point of the river and a transverse system, e.g. another river branch, a brook, a (rail)road, a hill range, a defence line. The meeting-points are architectonically marked by fortresses, cities, bridges etcetera.

The study is part of the multidisciplinary research project "Working on living rivers", which is set up by Delft University of Technology (faculties: Architecture, Civil Engineering) in close cooperation with the Ministry of Transport, Public Works and Water Management (Rijkswaterstaat).



Form of the river valley in the Dutch river landscape

THE WORK OF THE DUTCH ARCHITECT H.TH. WIJDEVELD (1885-1987)

Drs. Mariëtte van Stralen

The object of my dissertational research project at the Technical University Eindhoven is to present a comprehensive survey of the work of the Dutch architect H.Th. Wijdeveld (1885-1987). Sectie Architectuurgeschiedenis- en Theorie, Fac. Bouwkunde, TU-Eindhoven, Hoofdgebouw 3.51, Postbus 513, Postvak 4, 5600 MB, Eindhoven. Private address: Ungerplein 6A, 3033 BS Rotterdam, tel/fax: 010-4679.643

Although the reputation of the Dutch architect Hendricus Theodorus Wijdeveld (1885-1887) is fairly secure, both at home and abroad, it generally rests on just a few aspects of his varied oeuvre. Wijdeveld seems to be primarily associated with the Wendingen magazine, of which he was (chief) editor and designer from 1918 to 1926. But he's also known for his more radically utopian projects, for example the reconstruction plan for the Vondelpark in Amsterdam, including the Groote Volkstheater (1918-1919) and the expansion schemes for Amsterdam in the shape of peripheral residential towers (1918-1958).

Giovanni Fanelli's discussion of Wijdeveld's work in his book Moderne architectuur in Nederland, 1900-1940 ('s-Gravenhage, 1978) typifies the reception of his oeuvre. Fanelli writes that the futuristic and ideal-projects make up for a larger part of Wijdeveld's work than his actually realized plans. Wijdeveld's projects after World War II are even described rather dismissively as largely rhetorical reruns of his utopian designs from 1920-1940. It was Nic. Tummers who set the tone for this reception with his article 'De mise en scène van de architectuur, Plan the Impossible' in Bouwkundig Weekblad (29, 1965), which dealt exclusively with the utopian aspect of Wijdeveld's work. 'Wijdeveld has been working in the flush of the fantastic', Tummers wrote. This image has taken on a life of its own, which could be partly due to the lack of a serious study of his work. In contrast to what is usually suggested, his realized oeuvre is far from negligable. It comprises alterations of store premises, several major housing schemes in Amsterdam (1921-1927), the Institute Elckerlyc in Lage Vuursche (1938-1945) and a number of - sometimes huge - pavillions, including the Dutch Pavilion at the World Exhibition of Colonies, Shipping and Flemish Art in Antwerpen (1930).

Wijdeveld also worked in the fields of interior design, exhibitions, stage sets and printing. Beside that, he made a number of designs for country

houses, to which we dedicated a double issue of Forum (37/3-4, 1995, De landhuizen van, the country houses of, H.Th. Wijdeveld). This issue was the first attempt to correct the existing image of Wijdeveld. Constituting a cross section of Wijdeveld's oeuvre, his series of villa designs made during the period 1909-1970, allows us to trace his development as an architect very closely. This designs have been totally ignored in the history of Dutch architecture. Which is strange, since many of them are truly remarkable, both in scale, ideas and execution. One reason may be that the history of Dutch architecture has for too long been viewed from the narrow perspective of the Neues Bauen/International Style and De Stijl. Wijdeveld's undeniable modernism was of an entirely different kind than that of the architects of De Stijl and the New Objectivity. Typically, for instance, he was among the first to use modern constructions and techniques, such as the concrete skeleton, but unlike the architects of the New Objectivity he preferred not to expose these. Wijdeveld strove for another kind of architecture, centred around subjectivity. Luxury and comfort were among his main concerns in his country houses. The fascination with the 'Existenzminimum' which swept so many of his colleagues was foreign to him. What he shared with architects from such diverse movements as Expressionism, Bauhaus, Purism and De Stijl was his pursuit of a totally artistic, harmonious environment in the form of a Gesamtkunstwerk. But he didn't so much approach this Gesamtkunstwerk from a painting angle as from a theatrical angle. Maybe that is why he has remained misunderstood for so long. For it is the extension of this theatricalization of architecture into the most intimate domain of living which most characterizes Wijdeveld's country houses, and which makes them so extraordinary.

"CONFRONTING THE BARRIER BETWEEN QUALITATIVE AND QUANTITATIVE RESEARCH: COLLABORATIVE EFFORTS BETWEEN ARCHITECTURE AND NURSING AT THE UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE"

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The College of Architecture and the College of Nursing at the University of North Carolina at Charlotte have increasingly engaged in joint teaching and research during the last three years. We have found that the Nursing and Architectural professions are concerned with similar problems that offer numerous opportunities for collaborative research.

This past fall (1995), a research grant proposal, "Improved Design Delivery & Life Quality in Nursing Homes," was submitted for review to the National Institutes of Health and the Agency for Health Care Policy and Research, organizations characterized as "hard science" institutions. While our proposal was considered innovative and of interest, both agencies stated that funding for this type of research fares poorly in the context of traditional scientific research.

We had proposed to jointly examine the user satisfaction and building performance of a single long-term care facility in North Carolina, to improve the design quality and cost benefit ratio for an anticipated 40 year facility life cycle. The correlation of qualitative and quantitative data was a key component to this proposal. A technique of continuous comparative analysis was proposed to establish a linkage between "hard" and "soft" data, and also bridge the methodological differences between our two disciplines. We chose this approach because of the belief that neither quantitative nor qualitative research can independently provide a sufficient basis upon which a sound judgment can be formed concerning either the elderly or architecture. This was not an approach valued by our reviewers.

Key aspects of the criticism we received involved the assurance that the data gathered would be valid and as widely applicable as possible (global). It was suggested that the research be based on a sufficient sample (fifty

buildings) to generate a data base large enough to develop a working model. Qualitative methods were expected to be replaced with more exacting tools. The proposal was viewed essentially as a political problem that reviewers would feel uneasy about funding. The economic approach was attractive, although not fully understood, therefore the proposal should attempt to be educative. Scientific institutes are interested in funding publishable work and not surprisingly, support individuals who have generated a large number of publications.

Several criticisms above are inconsistent with the traditional objectives of architecture. It was in part the failure of a global approach that led to the demise of Modern Architecture. The methods employed by the social sciences do make it difficult to provide reproducible results, but as others have noticed, this is because reality is messy. Sound architectural production, as in setting the standard of care for the elderly, is in part, a political problem. Being asked to ignore these factors by scientific institutions because absolutes cannot be established seems unfortunate. It means of course that established science cannot find lasting answers to these problems and perhaps this is a pre-scientific justification of why a unique design response for each commission is considered a virtue.

Hope of finding flexibility in scientific assumptions does exist. By requesting that our next proposal be educative, the review panel adopted a position of openness, suggesting that financial support could occur if sufficient justification for undertaking the research can be proved, and if the substantiation of the personnel and the methodological approach survive a close scrutiny. In retrospect, the work proposed was synthetic which appears to be contrary to routine scientific investigation. As a discipline we have no choice but to continue probing this dilemma, of being a scientific fit or misfit. Research is undertaken to contribute to the improvement of man's estate; architectural research seems no less so.

ARCHITECTURE, NARRATIVE AND HISTORY: EGIDIO DA VITERBO AND THE PROBLEM OF HISTORIOGRAPHY

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Recent interest in narrative readings of architecture has emerged in part as a consequence of the growing pre-occupation with simulated realities and their impact on traditional forms of representation. The well-documented Derridean concepts concerning the implicit textuality of architecture, whose underlying meanings are contingent to the inherent ambiguities of language, pre-suppose the existence of an imbedded narrative structure in architecture where symbol and form can be extracted from their larger context. Here, the exploration of architecture as a series of signs, or notational devices, creates the conditions of a self-referential system, autonomous from the traditional delineations of signifier and signified.

This problematic interface between metaphor and structure, the former defined as a representation whilst the latter as a 'differentiation', has historical resonances that first emerge in the Renaissance. Whilst it would be simplistic to claim any direct correlation between Deconstructivist textual readings and those of the Humanists, it is evident that the development of a hermeneutics in Renaissance literary and historical criticism had an influence on architectural representation, as a re-enactment of narrative constructs. This redefining of architecture as 'frozen narrative', or a form of mimetic reading, in the Renaissance forms one of the themes of my PhD research.

Built upon the Humanistic practice of measuring and legitimising contemporary events on the basis of mythical or historical precedents, the proliferation of scholarly investigations of Rome's imperial past became a central platform for re-authenticating reality. This can be found in the historiographical writings of the well-known Augustinian friar and leading 16thc humanist, Giles of Viterbo. As chief spokesman to the papacy of Julius II, Giles was particularly influential in formulating the theological background to Julius' political ambitions, reinforcing the notion of historical continuity between his time and that of Antiquity. Through close associations with the

leading artists and architects of the age, Giles was probably influential in the conception and design of a number of urban and artistic projects in Rome, from Bramante's urban interventions along the river Tiber to Raphael's frescos in the Stanza della Segnatura.

For Giles these projects represented a re-affirmation of his own complex historiographical constructs in which there existed a hereditary link between archaic (or Etruscan) Rome, the Old and New Testaments, Imperial Rome and the new Golden Age of the Julian court. Perhaps the most provocative account of this continuity can be found in his *Sentences*, which describes a mystical partnership between the Etruscan god Janus, the Old Testament saviour Noah and St Peter. By identifying, for example, what he believed to be an etymological link between Janus and Noah, and a parallel attribute between Janus and St Peter (ie. 'the key bearers'), Giles revealed an umbilical thread of providential events. This finds architectural expression in the layout and orientation of the street via della Lungara, an element of Bramante's urban project, which forms an important ceremonial link between St Peter's, Trastevere and the Janiculum Hill, the latter being the hallowed site of both the archaic temple to Janus and of the martyrdom of St Peter.

Influenced by St Augustine's concept of the three-fold present of time *(distentio animi)*, Giles recognised a quasi-spatial quality in historiographical narrative that had clear architectural implications, particularly evident in the frescos in the Stanza della Segnatura. My research explores the thematics and structure of these representations and their possible relationship to Bramante's urban interventions. It thus aims to assess the impact of Humanistic historiographical narrative, with their reliance on classical models and imperial symbolism, on architectural representation in the early 16thc.

FOUR KINDS OF CITIES

A model of the built city as a practice

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I would like to propose four urban types. These types are not distinguished by their morphological features, but by the role played by the government as a public body, by private initiators or participants and by the categorie of the 'plan', in the practises that make a city grow or subject it to reconstructions. In the following the word 'city' does not denote the urban territory or a particular piece of land within it, but a specific kind of practice which could take place or make a place within its legal and physical boundaries.

• 1 • The **traditional city,** where the government only places general legislative restrictions (in the form of building-lines, fire-regulations etc.) and sees to their maintenance in a more or less consistent way. Here, the city is a tumultuous theatre with multifarious private transactions in land and houses. This city goes back at least as far as the late middle ages, and it exists today.

• 2 • The **book-keeping city,** in which drawings are figuring in a purely instrumental, rational manner (i.e. not in a aesthetic/stylistic or 'rethorical' manner), that serve to bring about an agreement between various claimants and particularly between various participants; the financers that take part in this scheme. This city has existed since approximately 1600. The plan itself, basically drawn up by technical, juridical and financial experts and, most importantly, surveyors, is of a public character. As a shareholders construction, the scheme contributes to the mobilisation of capital and, hence, to the realisation of major works and (especially in the 19th century), large restructurings. In theory and usually also in practice, the scheme, in its private nature, provides opportunities for particular (large-scale) land and development speculations on the part of private persons or compagnies, based on their relation to the plan (either contractual or not) and the information they have of it.

• 3 • The **architectonic city,** in which figure drawings that give a

representation of a part of the city in an aesthetic/stylistic or 'rethorical' way and that therefore primarily address spatial form. Here, the objective is to achieve a stylistic differentiation (in particular in relation to other parts of the city). From the point of view of the politics that bear on land-values, this distinction reached and announced by architecture is instrumental in the optimalisation of the ('potential') surplus-value of certain parts of the city. Such plans are related to a form of property development and to the realisation of ensembles intended for the upper class and, especially, for those situated just below this top layer. The government plays a part of some importance in this kind of projects, because of the often necessary expropriations and the laying of infrastructuralk works (just like in Ñ2Ñ) but also, generally speaking, in the drawing up of special regulations bound up to a specific piece of land (the allocation). The architectural design or, more especially, the architectural drawing, depicted in prints, books, prospectusses, cultural magazines etc., is, from the point of view of the developer, instrumental in the realisation and optimalisation of the surplus value corresponding with the building up of images. One of the first outspoken examples of this kind of city is the Strada Nuovo in Genua, built from 1550 onwards, and the most pure example can probably be found in the Georgian housing projects in cities like London and Bath and developed by speculators or speculating architects such as Nicholas Barbon and John Wood. As can be seen most particularly in the American suburb, this city is partially dated and overtaken because of the explosively increased mobility that made possible a purely teritorial differentiation or 'splitting up', in which the surplus value of the land simply corresponds to the level of income of the neigbours, and 'architecture' represents no more than an exclusively imaginary value (exept in the case of collectors items, such as a real F. L. Wright).

• 4 • The **public housing city.** This city is completely brought about by the government (including the institutional investors that administer the pension funds an the like). The objective is 'affordable' housing of households of employed breadwinners - in which 'affordable' should of course be seen in the light of the totality of production costs and sales potential. This implies a minimizing of every surplus value attached to the land, or the elimination of the effects of the real estate market in favour op an expansion of sales potential (and, hence, of production). This city is a consequence of the social contract concluded between government, industry and social movement; a contract realized by such institutions as the Sociaal Economische Raad ('Social Economic Council'). This type of completely government controlled urban

planning presents itself as an adjunct of general and social progress. By this token, here too aesthetics plays an important part: in its spatial form the city should express the 'dignity' of human being in general, or more to the point, of the employed breadwinner and his hopes and expectations in as far as they have become invested in the welfare state.This aesthetics is instrumental in the formation of a social cohesion but is now, other than in Ñ3Ñ, abstract (for not bound to a specific clientele, gathered around a certain person and informed by his predilections) and, in principle, should not cost anything (for it does not yield any surplus value), and is therefore restricted mainly to composition and colour. Apart from some early projects, financed directly by the industrial entrepeneurs themselves, this city is in existence since the Housing Act of 1901, but the period before the Second World War can be seen (at least in retrospect) as an experimental phase. In Western Europe, this city, in its typical form of the 'Stadtlandschaft' and the accompanying and necessary big role put aside for the government, became fully developed in the offices of the Vichy-government and those of the Third Reich (above all, the plans drawn up for the extension of Hamburg by Konstanty Gutschow and his staff of several hundreds of architects and engineers), and was put into practice in a complete and consequent fashion in the third quarter of the twentieth century. In addition to post-war Western Europe and the Third Reich, we can also find this city in Roosevelt's post-depression New Deal and of course in the Warsaw Pact countries.

In my opinion it would be wise to distinguish two kinds of elites from the sixteenth and seventeenth century onwards, or at least two kinds of markets and two kinds of investments, which have diametrically opposed interests: On the one hand the world of industrial entrepeneurs and trade-capitalists and on the other the world of developers and real-estate speculators which is, at least in its top-layers, rather more than less elitist, for the simple reason that their doings are by their very nature directly focussed on differentiation or 'status'. In this opposition labour unrest is a lever in the hands of the industrial entrepeneur, and housing rents - especially in the lower end of the market - are the outcome of the balance of power between these two worlds and the possibilities for investments linked to it, as can be clearly shown in the very early case of the extension-scheme for the city of Leyden, drawn up in 1644.

Of course, these four types together are no more than a rough outline of a theoretical model. Executed schemes will show either transitional forms or combinations and these are bound to be the most interesting. It may be assumed that these types, and many of their inherent properties maintained

their validity from the 17th century onwards. The large amount of historical records we have at our disposal may be used to investigate ways of land-issuing, wether or not specific forms of speculation were discouraged, if there is any coherence with the morfology and aesthetics of the city, and how this affected the city and urban society at large.

EPISTEMOLOGICAL MAXIMALISM VS. PROFESSIONAL MINIMALISM

(or, why a professionalist education cannot do justice to doctoral research)

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The part of the university education servicing professions of design, architecture and planning is based on a well-established, but seldom-admitted compromise. It is that while largely adopting the traditional organisation of the university curriculum, it is mainly the *professional* knowledge and skills that constitute the primary objects and objectives of the design and planning courses. The scope, the methods and the emphases of such knowledge are variously specified, suggested and inspected by professional bodies who may also validate courses periodically - often quite outside the powers of universities' academic authority.

It can be observed on this background that research in design and planning departments, and doctoral research in particular, is relatively new and rare even in countries which may otherwise have rich traditions of research in other disciplines. Furthermore, an integral use of research-based knowledge in design teaching is even rarer.

These paradoxes cannot be explained locally. If there is any problem, it is largely to do with

a. the specific *sociological* characteristics of the 'professions' (as distinct from 'disciplines'),
b. the *epistemological* nature of the knowledge identified with design and planning practices, and
c. the *pedagogic* modes and methods that were built up in schools of design, architecture and planning.

To even begin to discuss the problems of doctoral research (or, 'research education' as I would call it), an understanding of the relationship between the three dimensions mentioned (i.e. the sociological, the epistemological and the

pedagogic) is essential. This can be done with reference to two concepts that I have been developing in this context: *'epistemological maximalism' and 'professional minimalism'*.

The first condition is to do with what university education is (or, should be) all about. It should pursue an ideal according to which more and better knowledge would be the aim of teaching, learning and research.

The second condition, however, arises out of the workings of a profession that does not produce much *new* knowledge in the course of its 'practice' although it uses and somewhat transforms existing knowledge, information, know-how and skills. It is almost totally pragmatic, selective and problem-oriented and is 'critical' in a narrow sense specific to design activity.

Falling between these two conditions, architectural education tries to satisfy the requirements of a professional (and almost vocational) *training* and a process of entering a profession while, at the same time, trying to be the main source of new, greater and more critical knowledge as expected of university disciplines.

The conflicts and inconsistencies therefore arise out of the co-existence of

(a) the professional claims that its 'practice' is, 'in the end', the main arbiter of knowledge, skills and educational achievement as *it* defines them to be relevant to *its* purposes, and

(b) the inability of the education to stand up to the professional definitions by asserting the specificity, relative universality and multiplicity of objects, objectives and purposes of knowledge beyond immediate utility.

On this background, doctoral research in architecture, design and urban planning cannot be immune from the conflictual demands, inconsistent expectations of end-results and partly incompatible assessment criteria. Additionally, doctoral research is a form of research that is done first and foremost in educational contexts. It is a (higher) form of education. Seen from a professionalist point of view, doctorates in design and architecture cannot be a viable form of activity that would be acceptable to *professional* arbitration or assessment. Yet, the denial of that form or level of work might imply both a denial of knowledge and an untenable assumptions regarding the origins of the knowledge taught in undergraduate education.

While the established university traditions on this matter seem to present some initial problems for designerly approaches to knowledge, that tradition can however be enhanced by a form of creativity that design disciplines are best equipped to promote if only they could see their roles beyond mere training of professionals, and extend their responsibilities to knowledge, culture and society. It is therefore suggested that doctoral research, developed in both style and substance, can become a major source of new knowledge, critical habits and educational advancement in design, architecture and planning.

Notes:

For an expansion of the concepts and observations presented above, some of my earlier writing can be referred to:

- *Architectural Education - Issues in educational practice and policy,* London, Question Press, 1992;
- A Hardy and N Teymur (eds), *Architectural History in the Studio,* (in press).
- 'Learning housing designing', in M Bulos and N Teymur (eds), *Housing: design, research, education,* Aldershot, Avebury, 1993, pp.19-23.
- *Problems in Professional Education: Conflicts of Definitions, Objectives and Knowledge,* South Bank Architectural Papers, No.7, London, SBU, 1981.
- 'From Theory to Discourse', in Protzen, J P (ed): *Planning and Design in Architecture,* New York, ASME, 1987, pp.71-74.

JUNCTIONS BETWEEN COMPONENTS

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This paper contains information on the authors observations in his research on the junctions between components. Explained is why thy he thinks these junctions are interesting in what way their qualities can be used. The author is studying on a design method for junctions between components in prefabricated building. Therefor he researches what character different types of junctions may have with the appliance of the prefab concept, in order to be able to make statements about how it can be used in the design of a building. To shape these ambitions the author tries to:

Gain insight in how the prefabrication concept is built up, to state in which direction the logic of the idea forces the optimum;

Analyze existing junctions and work them out in a form comparable among themselves;

Then formulate a theory on the method of the junctions;

To try out the theory on a 'one to one' built test model;

Finally test the theory.

In the future all products forming a building together will be prefabricated. The only action at the building spot will be the delivery of the building.

The attractive issue of prefabrication is the fact that the production can be controlled severely. With the introduction of the building component another piece of the building process has been made independent of the influences of the outer world. However, to make the machine work, all the internal resources of prefab must be used fully.

In the paper is explained briefly what is meant by the subject component and what the consequences is of using them.

Furthermore three prepositions are stated, which are giving the consequences for the junctions between components in the relation between components and their qualities.

Preposition one:

'Reducing the laboriousness of the assembly of components down to zero is possible'

With the use of the qualitatively superior prefab components the junction is backward. Often, the junction is a permanent temporary solution which has to be created on the building site. Formulating a design method may change this. A better balance between the products and their junctions at all levels of products is important.

Preposition two:

'To exploit the maximal durance of the used products the junctions must be worked out on all the different levels of products'

The factor that is declining the quickest and is the hardest to control is the 'social decline'. Mechanical decline can be slowed by using products of permanence, but the change of opinion can't be predicted. The junction needs the flexibility to exchange products. The component does not only need the possibility to be assembled easily, but it needs the possibility to be disassembled easily as well.

Preposition three:

'To make architecture with prefabricated products, tuning the products and their junctions for product development after the logic of the action of the logic of the concept of prefabrication is necessary'

The building process with prefab is often oriented in industrialized production en mass production: repetition of large parts and productions with low variety in large stocks. Thus, an only small specter of styles can be realized in prefab. A well-thought scheme of scale and measures of repeating products is inevitable. The way in which components can be inflicted is however depending on how the junctions are designed.

THE MAGIC OF THE MOVING FIELD

Questions towards the architecture of the city based on critical reflections and research in view of the defiant schizophrenic situation in which cities actualy prosper.

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Introduction

It cannot be denied that the nowadays crisis of the confidence in the way town planning, urban design and architecture anticipated on the social development after the second World War, is widely prevalent. This shouldn't be a surprise knowing that the social and spatial circumstances and rationalities, on which the urban development and design was based, meanwhile perished radical changes. Even the unit between the architecture of the building and the architecture of the city and the potential connections between theory and practice disapeared.

Aims of the research

The current image of our times (society, cities, ...) marked by schizofrenic conditions, puts new challenges and questions towards the theory and the practice of disciplinary fields such as town planning, urban design or the architecture of the city. It's not a question of defining a new formal order for the cities or of choosing between sustainability or unceasing renewal, order or chaos, expansion or reconversion, certainty or coincidence. It's rather a question of accepting the plural, dynamic and schizofrenic character of the social and urban development as a starting-point for re(de)fining the role, the tasks and the legitimation of the concerned disciplinary fields.

In this view the proposed approach contains the urge to fathom the plural, dynamic, and schizofrenic character of the social and urban development and the different rationalities which are related with this character.

Research methods

To explore the different spatial rationalities characteristic for the urban development, historical research is necessary. The historical research contains:

- the research of the literature about the history of the Belgium city and the landscape;
- the research of urban planning and design methods pointed at the analyse of the (hidden) rationalities of the urban development, the spatial structure, fragments and artefacts and their temporality.

Based on this knowledge, conditional interferences will be proposed so that the possibilities of adaptation, modification and reversibility on the one hand and the control of roll offs on different scale- and timelevels on the other hand, can be analysed, illustrated and worked out.

Its' and approach in which slumber the possibility of relating town planning and the architecture of the city with the capacity of changing, with the 'mobility' of the spatial, material culture and the potential reversibility of it. Such an approach doesn't contain a meterial output in the sense of creating a spatial modification by designing new, 'original' and 'closed' artefacts. Such a way of working conducts to a waste of energy, raw materials, space, time and creativity. The submitted approach rather consists of the manufacture of a 'dynamic, material culture' based on and working with spatial structures and urban and architectural rationalities to generate spatial conditions in terms of - to refine - principles such as reconversion, incorporation, flexibility and reversibility.

This approach will be test on contempary plans and projects as those of, for example, B. Secchi, A. Geuze (West 8),...

Examples of the problems and/or challenges connected with condensing urban spaces should also illustrate that this spatial question is not only situated on the scalelevel of the architecture of the city but also on the scalelevel of the architecture of the building.

The statement which slumbers in this approach could be that the architecture of the city no longer should be an activity which only results in plans and projects but also should be pointed at a creative development and conduct of a 'strategic proces of the spatial management of the moving field'.

"Puisque le monde prend un cours délirant,
nous devons prendre sur lui un point de vue délirant."
(Jean Baudrillard, 1990)

IMPROVEMENT OF THE QUALITY OF ROOMS BY WELL-CONSIDERED DESIGN OF WINDOW OPENINGS

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Introduction

It is a well known fact that window openings differ from an architectural point of view. Window openings can also be categorized with respect to applied materials and application of electronical devices. Ongoing developments in these so called daylighting systems focus on improving illumination of rooms by optimizing the use of daylight, and by controlling solar radiation. In this way improvement of visual performance and visual comfort and a decrease of energy consumption can be achieved. Considering the fact that the design of a daylighting system will mainly affect the illumination - and thus the visual quality - of the room, it is necessary to control this design process. The architect can control this process using adequate design tools and criteria. The design of daylighting systems will also have a great impact on the architectural expression of a building, especially when dynamic daylighting systems are part of the facade.

Aim of the research

This research will be carried out to determine how the visual quality of rooms can be improved by well-considered design of window openings.

To define the impact of daylighting systems on visual comfort and visual performance in a room it is necessary to know:

- how the illumination of a room can be evaluated concerning the visual quality,
- the impact of changes in the design of daylighting systems on the illumination of a room.

Research methods

The following programme of work has been drawn up:

1. A survey of daylighting systems will be conducted to obtain an overview of existing daylighting systems and their applicability. The temperate climate will be a restrictive factor, therefor only applications

of daylighting systems in countries such as Canada, Denmark, Germany and the Netherlands will be studied.

2. A monitoring protocol will be defined to investigate the impact of a daylighting system on the illumination of a room. Quantities to be measured will be identified and experimental procedures will be defined to establish the visual quality of a room as a result of the applied daylighting system. This part of the research will take place in association with the International Energy Agency, within a research project on daylight in buildings.
3. Existing methods used to assess visual performance and visual comfort will be evaluated in case-studies and scale models. So far these methods are only applicable in situations with artificial lighting. The applicability of these methods in the case of daylighting systems will be examined.
4. The impact of the design of daylighting systems on the illumination of a room will be determined with software and scale models. This illumination will be analyzed with respect to visual comfort and visual performance. Besides the visual aspects of the quality of a room, energy aspects will be reviewed.

This research will result in a practical design tool and design criteria. In addition the main goals are to review the impact of design of daylighting systems on illumination of a room and guarantee satisfying visual performance and visual comfort in a building by using daylighting systems.

Preliminary conclusions

Since this research is at an early state, only preliminary conclusions can be drawn. This research will determine whether existing methods to assess visual performance and visual comfort in situations with only artificial lighting can be used in the case of daylighting or combinations of artificial and daylighting. By means of these methods and a design tool concerning the impact of daylighting systems it will be possible to realize satisfying visual performance and visual comfort in a building.

AN ATTEMPT TO UNDERSTAND THE DESIGN PROCESS OF UNCONVENTIONAL BUILDINGS. ANALYSIS OF A SOCIAL PHENOMENON.

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Aim: This research investigates the design process of unconventional structures starting with the hypotheses that it is different from, and more difficult than, that of conventional structures. In the thesis unconventional structures are defined as long-span structures covering column free spaces without employing beam-column structural systems.

The design of nine unconventional structures provide case studies for the exploration of the design process. Interviews were carried out with the architects and engineers who participated in the design of each case study. The interviews were conducted following an open ended interview guide.

The issues addressed at first were: :

i) the questions that had to be asked of the informants,
ii) the way that these questions had to be asked,
iii) the choice of the case studies, and
iv) the choice of the informants.

The answers to these questions were:

i) questions about the process of design itself gave genuine information which cannot be found elsewhere.
ii) two pilot studies indicated that the use of a structured questionnaire was difficult to follow. Semi-structured in-depth interviews following an interview guide were thought more appropriate.
iii) all projects fell into the category of unconventional buildings as defined by the present study. The design team that contributed to the design consisted of both architects and engineers. Difficulties during their design processes were reported in the literature.
iv) the interviewees were "key persons" of the design team.

Research Methods: The data were classified and analysed with the code procedure that is prescribed by the Grounded Theory, a well established method developed in social sciences which aims for insight into social phenomena. More specifically, the code procedure followed the stages of open, axial and selective coding. The outcome of the open coding was a list of all phenomena appearing in the respondents accounts. The axial coding made connections between categories and subcategories which emerged from the open coding. The selective coding led to the selection of the core category of a general paradigm model of the design process. The paradigm model draws associations between the core category and its properties, the context in which it happened, the intervening conditions and the strategies to be adopted for the resolution of the problem.

Main Conclusions: The analysis of the interviews show that difficulties lie in the nature of tasks and timing of the intervention of each discipline, in the specific knowledge of technical issues, in the degree of experience of individuals in the field of unconventional structures, in the different degree of familiarity that individuals have with means of communication and simulation and in the new architectural language of forms for unconventional structures.

These conclusions were tested against further research based on a study of the literature describing three further case studies and interviews with four leading designers. The outcome of this work confirmed that the design process of conventional and unconventional structures is an intuitive, cyclic problem solving task which involves the modification of preconceived models in order to arrive at a solution. This process functions and follows the same pattern of iteration and testing of ideas by error elimination irrespective of the conventional or unconventional nature of the outcome. Thus the design process of conventional and unconventional structures is essentially the same, refuting the first hypothesis, but the design of unconventional structures involves a greater number of iterations to eradicate difficulties. In architecture tests are largely qualitative. In engineering they are more quantitative and when designing an unconventional structure it is necessary to invent not only the solution but also the test.

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ARCHITECTURE OF INSTRUCTION AND PLEASURE

a socio-historical and conceptual analysis of structure and change in the 'didaxis' of World Exhibitions during the 150 years of their existence.

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The subject of my dissertation is the concept of the World Exhibitions, and the major transformations this idea went through during the 150 years they are held up till now. Seen from a socio-historical standpoint I understand them first and foremost as a didactical apparatus of a temporal nature meant for instructing the people in western societies about the utility and pleasures of the emerging of a modern industrial global economy and society. Without exception they do this by using the latest insight and techniques about education, and using the newest media to make sure their exhibition will attract, delight, and instruct as many people as possible. The architecture and the spatial layout of the site are always playing a keyrole in this proces of instruction, so that one can speak of the emerging and development of a 'didactical architecture' of a temporal nature typical for exhibitions.

To be able to determine the main characteristics of this temporal and didactical phenomena I develloped a conceptual framework in which I combined a scheme which pictures the exhibions as an educational proces with one which interpretes them as an organizational proces. So I analized each exhibition on aspects of organization, ideology, didaxis - including architecture -, and public. The analytical character of my study is further heightened by not telling the history of the exhibitions by describing them all during their 150 years of existence but, through periodization of its history with respect to their didactical form in five episodes, by the analysis of the the most typical or innovative expositon exemplary of one of these periods. So, I selected the exhibitions of 1851, 1867, 1900, 1939, and 1970. By doing this, I am able to describe at the same time the didactical characteristics of each exhibition or period in the light of its socio-historical context, as the main developments the concept went through by putting up these exemplary expositions or episodes to each other. Lastly, to avoid anachronistic conclusions I used for my research only primary sources like documents, drawings and pictures from archives.

While it is impossible to explain here the full extent and importance of my

study, I will try to give you an idea of it by taking one of the exhibitions I studied as a case. By analyzing the original plan made for the first World Exhibion ever in 1851 I will show that this must be understood as an example of a 'didactical architecture' of a temporary nature. Spatial distribution of the program and routing, construction and materialization, style and the iconographic program of decorations are all contributing at the education of the public by the exhibits. Next I will show how the original plan as a consequence of the typical problems of organizing and realizing a temporary worldwide exhibition transforms in quite a different building as was foreseen, yet still basicly a didactic architecture.

By ending my lecture with a brief comparison of the differences of the 1851-exhibition with contemporary ones, I hope to underline the value of my study and the research method I develloped. Of course the main objective of my study was the analysis of how society saw conceptually an exhibition in the succesive stadia of her historical development, and how architects develloped a typical 'exhibition-architecture' of a didactical nature for it. By doing this I hope my study will also be of help to architects and planners of todays and tomorrows exhibitions to understand what a World Exhibition should be in the current socio-historical context. But, beyond this my study is also a plea for a new kind of architectural history as a kind of conceptual or analytical study of the historical development of architectural or urban questions. Herein architecture will be pictured as the synthesis of personal craftmanship, the disciplinary state of the art in architecture, planning and construction çnd the social requirements it has to fullfil; all within the limits of a specific socio-historical context. Such kind of studies could help architects by teaching them the history of the questions they have to solve, to comprehend their nature fully, and thereupon to understand thanks to this new analytical and historical insight truly what this means today, in stead of making the entertaining but non-sensical phantasies of an dilettante or a showman.

DESIGN PhDS IN ARCHITECTURE

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If some design activities may be regarded as research then it ought to be possible to have design PhDs. The form that these might take is suggested here by considering the requirements of a PhD examination as well as the ways in which architectural knowledge might be extended through design research. It also suggests that for this purpose the practice of architecture as a craft needs to be distinguished for architecture as an art and considers the different kinds of exercise that this distinction implies.

The amalgamation of British universities and polytechnics into a single system, with both subject to funding through the RAE, has made it necessary to think about how design might be regarded as a legitimate research activity. Departments which had not needed to define this activity in a way that might be acceptable to a wider academic community now need to do this.

In a previous article (Yeomand, 1995) I considered whether architectural design might be considered as research and a natural extension of this is to consider whether there might be design based PhDs. The idea of a design PhD extends the definition of design as research, put forward previously, but in a particular context because a PhD is a restricted form of research from which it may be necessary to exclude some kinds of work which, although valid as research, are not appropriate to the constraints of a PhD examination. The task therefore is to define the form that a design PhD might take in terms of the aspects of the candidate's research that are examined.

- The notion 'full country' refers to the dissertation of prof. A. van der Woud on the 19th century physical planning in the Netherlands, called: "The empty country" (Baarn, 1987). This study stresses the opening up of the country by fast and secure connections.
- André Corboz: "L'Urbanisme du XXe siècle. Esquisse d'un profil", Zfrich 1991. Translated into Dutch in Archis 5-1992, pp 49-52.

- In 1867 Ildefonso Cerdç published his "Teoria general de la urbanizaciòn".
- Reference to the exhibition "the Netherlands as a work of art", Rotterdam (NAi) 1995

Index of names

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8 - 10 FEBR. 1996

TU Delft

Technische Universiteit Delft

ISBN 90-5269-199-1