EDITORS

Johan De Walsche
Susanne Komossa

ARCHITECTURAL RESEARCH VIS-À-VIS RESEARCH-BY-DESIGN

PROTOTYPES AND PARADIGMS

PROTOTYPES AND PARADIGMS

After 10 years of exploring the possibilities and ways to integrate Research-by-Design into Architecture Design Studio Teaching and PhD Theses in Architecture, Landscape Architecture and Urbanism at various universities in Europe and around the world, the time has come to investigate these matured/maturing research approaches in relation to existing paradigms of architectural research & design.

ARENA

DR_SoM | Design Research, Series on Method

AIM AND RATIONALE

After some decades of development, design research has come of age. Dynamism, originality and particularity are major features of this field of research, and must be cherished.

There is no longer any merit in demonstrating the existence of high level academic design research, nor in demonstrating the breadth of this field, nor the multitude and diversity of issues that it tackles. Instead there is a need for a stronger establishment of this field of research, in order to reach and convince a broader audience, inside and outside the field, researchers as well as practitioners, institutions and industry as well as policy makers.

The epithet 'Design Research' still acts as a huge umbrella, spanning a broad range of diverse approaches. The rationale of the ARENA project **'Design Research, Series on Method' (DR_SoM)** consists in the belief that discerning common and distinctive features between approaches, and identifying particularities and coherence between themes, tools, strategies, and discourse, will contribute to a better understanding of the scope and capacities of design research. This will be helpful to be more precise in research proposals, in identifying appropriate peers, in establishing accurate assessment of the outcome, and finally it will inspire for future endeavours. At last, a better comprehension of design research as an academic field and culture, will contribute to a better communication, interaction and exchange with other research disciplines and communities. It will demonstrate its ability to be a catalyst for inter- and trans-disciplinary endeavours, and offer new approaches to pending issues.

Johan De Walsche, Oya Atalay Franck, Roberto Cavallo, series editors.

ORGANIZATION

Through a series of research seminars and workshops, the DR_SoM project sequentially focusses on particularities and common ground within kindred approaches in architectural design research, including design as creative practice to generate and share new insights through making, through reflective practice, through emanating theoretical concepts, through scenario writing, through action research, and to innovate through developing new prototypes, new models and new typologies. Each meeting consists of a small group of young and senior researchers (e.g.15 to 30), gathered through a particular approach, and sharing a common interest in the issue of methodology in design research. Plenary panel presentations, table discussions and keynotes, avoiding parallel sessions, allow for in-depth debates and lead to mutual exchanging expert knowledge, and sharing insights between presenters and commenters, and novice and senior researchers.

SCIENTIFIC COMMITTEE

Oya Atalay Franck, *project leader*, ZHAW WINTERTHUR
Johan De Walsche, *project leader*, UNIVERSITY OF ANTWERP
Murray Fraser, UCL BARTLETT
Susanne Komossa, *organizer*, TU DELFT
Flora Samuel, READING SCHOOL OF ARCHITECTURE
João Sequeira, ULHT/LABART LISBON
Johan Verbeke, KULEUVEN/AARHUS SCHOOL OF ARCHITECTURE
Pieter Versteegh, ESA ECOLE SPÉCIALE D'ARCHITECTURE, PARIS.

1st
Architectural
Research
Network
Meeting

TUDelft

ARCHITECTURAL RESEARCH VIS-À-VIS RESEARCH-BY-DESIGN

PROTOTYPES

AND

PARADIGMS

1st TU Delft - ARENA Architectural Research Network Meeting

Architectural Research vis-à-vis Research-by-Design
Prototypes and Paradigms

1 November 2013
9.00 – 18.00 Berlage Room 1 + 2
Faculty of Architecture and The Built Environment,
Delft University of Technology, Netherlands

Meeting's Scientific Committee
Prof. ir. Karin Laglas, Dean, Faculty of Architecture, TU Delft
Assoc. prof. dr. ir. Franklin van der Hoeven, 100% Research, TU Delft
Prof. ir. Michiel Riedijk, Architecture, TU Delft
Prof. dr. ir. Han Meyer, Urbanism, TU Delft
Prof. ir. Dirk Sijmons, Landscape Architecture, TU Delft
Assoc. prof. dr. ir. Susanne Komossa, Architecture, TU Delft,
Assoc. prof. ir-arch. Johan De Walsche, Faculty of Design Sciences, University of Antwerp
Prof. Dr. Murray Fraser, Architecture and Global Culture, Bartlett School of Architecture, UC London

Meeting's Organizing Committee
Susanne Komossa, Architecture, TU Delft,
Johan De Walsche, Faculty of Design Sciences, University of Antwerp

Meeting's address
Faculty of Architecture and The Built Environment
Julianalaan 134
2600 GA Delft
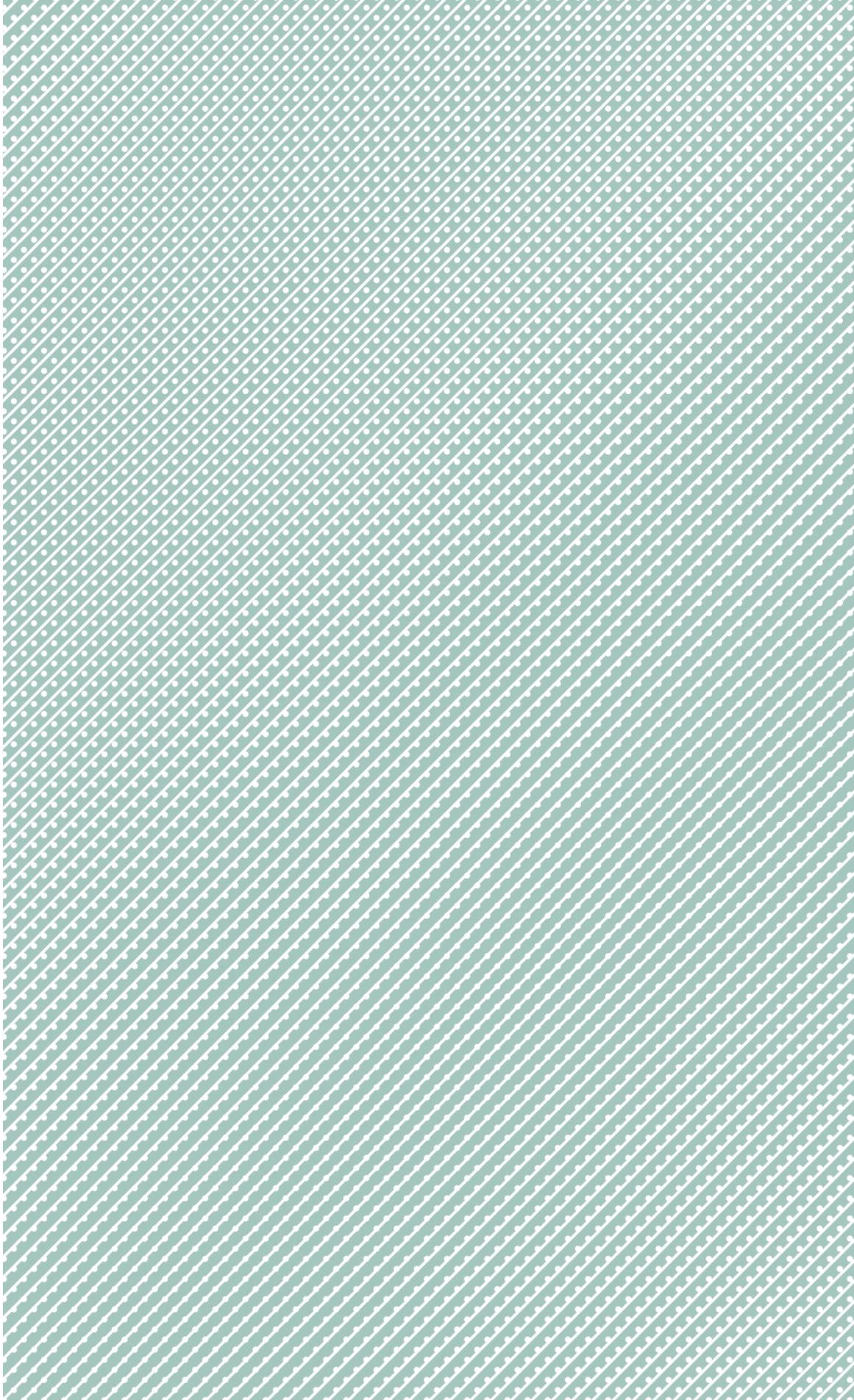
Architectural research
vis-à-vis
Research-by-design

After 10 years of exploring the possibilities and ways to integrate Research-by-Design into Architecture Design Studio Teaching and PHD Theses in Architecture, Landscape Architecture and Urbanism at various universities in Europe and around the world, the time has come to investigate these matured/maturing research approaches in relation to existing paradigms of architectural research & design.

The Delft Faculty of Architecture and The Built Environment will thus host, in collaboration with the ARENA Architectural Research Network, the 1st Meeting of a series, which explores and discusses all of the existing and emerging prototypes and paradigms at PHD level in architecture faculties throughout Europe.

Can we distinguish certain more or less proven methodological approaches and paradigms for Research-by-Design? And if the answer is yes, what are their aims, nature, validity and contents/products/insights in a qualitative and quantitative sense? What is their contribution to the production of new knowledge and ways of acting as designers?

Does it make sense to develop, teach and theoretically underpin new proto-typical and existi ng paradigmatic approaches/methods to establish more congruent design skills and make 'designer(ly) knowledge' explicit in our fields, not only in Bachelor's and Master's teaching but also at PHD level?

Additionally, are these methods and approaches, including their aims, recognised generally within our fields, and also within a wider sphere - for example, funding bodies such as the EU, National Scientific Boards, professional practises, building clients, and the like.

ARCHITECTURAL DESIGN RESEARCH COMES OF AGE

In 1997 the very first issue of 'The Design Journal' was introduced with an editorial entitled 'Design Research comes of age', indicating a next stage in the development of a young discipline. (COOPER, 1997) Rachel Cooper, the editor, states that the very nature of design research has been debated for half a century, and that it is time to provide the opportunity for 'design' to be considered as a scholarly discipline as well as a respected profession. In 2010, in the letter section of 'Architectural Research Quarterly', Murray Fraser headlines that 'architectural research comes of age'. (FRASER, 2010) While Cooper is making a plea for design research as an autonomous field, transcending disciplinary borders of engineering, CAD, management, art and design, Fraser emphasises the capacity of architectural design proposals to study the world from the perspective of the discipline. Architectural design, built and un-built, is able to communicate architectural ideas beyond the scope of the project itself. It is offering a necessary alternative to, for instance, the applied instrumentality that can typically be found in the field of environmental design and sustainability. Thereby it can by enriched by the rising impact of critical theory and cultural studies about architecture, and contributes to it, thus expanding the own corpus of research in architecture. Moreover it seems that also practice based

research and computational experimentation have left their ontological state, and are entering a next stage of development, contributing to the epistemological field of architecture, and tackling cultural, societal, political issues, rather than merely establishing their own reason for existence.

Indeed, after the crisis of the Design Method Movement (UK) and the Design Research Society (US) the belief in developing a unified science able to unravel the underlying mechanisms of design thinking had faded away. (BAYAZIT, 2004) These first generation of design 'scientists', tried to render the process of designing 'scientific', in order to optimize and methodize it. After their major antagonists like Alexander and Jones renounced, the intention to systemize the design process was abandoned, and replaced by the identification of specificities and capacities of 'designerly thinking'. (CROSS, 1982; LAWSON, 1994) These considerations led to value design/designers for its/their abilities to deal with complexity, ambivalence, otherness, uncertainty, contingency et cetera. Gradually, further explorations of awareness, cognition and abilities of designers moved design research from problem solving (during the '60's), over tackling wicked problems (HORST & MELVIN, 1973), to its power of imagination, delivering unexpected alternatives. (JANSSENS, 2008) 'Designerly' ways of thinking, and the power of creative practice could and should lead to generating new knowledge and insights, significant and original, and therefore become pathways of conducting rigorous research.

With the organization in 2000 of the 'Research by Design" conference (TECHNISCHE UNIVERSITEIT DELFT, 2001), the TU Delft was taking up a prominent position in the field. Synthesizing the attempts to identify design as a way of conducting research led to comprehensive publications as 'Ways to study and research; Urban, architectural and technical design'. (DE JONG & VAN DER VOORDT, 2002)

However, the more the twentieth century approach in studying the nature of design and design thinking evolved towards establishing 'design' as an autonomous disciplinary field, the more it drifted away from the interest of designing architects and architectural theorists. While the emancipated 'design science' is successfully offering service to a myriad of other disciplines, such as engineering, software development, management, biomedical technology, it has largely left the field of architecture.

Studying the process of design in terms of systematization, generalizability, predictability, optimization, seems more appropriate for industrial design and technological innovation aimed at industrial production, than it is able to stimulate

designing architects, or trigger researchers in architecture and architectural production.

Indeed, the notion of 'design studies' typically came into existence in the era of technological advancement and manufacturing, let's say from the beginning of the twentieth century onwards, thus dressed up as a symptom of modernity. On the contrary, the origins of studying and theorizing architecture and architectural design as a societal phenomenon and a discipline date back at least to Vitruvius, boosting in the renaissance when architecture was part of the 'artes liberales', developing its own contribution to 'scientia' by producing drawings, paintings and sketches. In fact, since 'we have never been modern' (LATOUR, 1993), conducting architectural research by producing design proposals, and thus mastering the arts of inventio and disegno, is a recuperation of a long tradition. Modernity was just transient, a passer-by. Conducting architectural research by design is in inscription in a continuing community of practice, eventually reconnecting to its disciplinary legacy. Time folds. (SERRES & LATOUR, 1995)

In spite of allegations and reluctance from traditional scientific scholarship to accept design as a valid pathway for inquiry, pioneer institutions, spread all over the world, demonstrated their conviction of the value and richness of design as a rigorous method to study architecture and society. During the last decennium their assertiveness and determination has led to a substantial practice-based research production, which challenges academic skepticism.

Techniques, modes and methods from architectural design practice, from academic research practice and from artistic production exist next to each other. Confrontations produced blends and hybrids, adoptions and adaptations. Universities establish architectural design laboratories, while links with professional practice are arising.

By its intrinsic inclination towards experimentation this emerging field of practice-based architectural research, also nourishes the critical apparatus, offering a new, matured condition of and for reflection and discourse.

There is no longer any merit in demonstrating the existence of high level academic design research, nor in demonstrating the broadness of this field, nor in demonstrating the multitude of issues that it tackles, nor in demonstrating the diversity of approaches and techniques that are involved. We can outdistance the ontological discussions whether design can be research or not, and advance to further exploration of the role and capacities of research-by-design. We can highlight inspiring and convincing practices and advancing findings. We can study

the position and purpose of design in inquiry, in connection to epistemological frames and paradigms. We can identify epistemologies, methodologies, morphologies and a myriad of techniques, and link them to architectural ideas and concepts, in search for an improved coherence in design research approaches. By dissemination of good practices we can enhance the meaning and capacity of design (as) research for society, profession, science, art and philosophy.

There is no reason not to take up the challenge that is put forward in the Sage Handbook of Architectural Theory, namely to start elaborating reflections on the actual attempts to bring architectural design research up to the level of recognized scholarly research by widening the set of available techniques and approaches, and simultaneously expanding the field of architectural research, and by doing so, even academic research in general. (CRYSLER, CAIRNS, & HEYNEN, 2012)

With regard to the relationship between academia and professional practice, vis-à-vis the actual situation of economic crises, it becomes evident that architects more than before, have to be explicit about what they can contribute to contemporary global and local challenges. Additionally this period of fast transition urges for new answers and approaches. Architects could and should dwell on the knowledge and action they can produce by designing new kinds of artifacts and projecting new proposals for looking to the future, while being part of multi- or cross-disciplinary research and design teams. Design research matters for both academy and professional practice, and should be conducted and rigorously developed in both environments, whether collaborative or not, since each place - characterized by its own modes, perspectives and conditions - offering a specific scope of opportunities.

CURRENT RESEARCH-BY-DESIGN APPROACHES AND PRACTISES

There are many ways, techniques, methods and approaches, which one might refer to as research-by-design in architecture. Depending on the place where it is conducted, it will have its own scope, modes and methods. Design research can be situated in practice, in academia, of in collaboration between both.

Innovation in the field of architectural design and production is largely situated in professional practice. Professional practice typically is an environment where the underlying processes mostly remain tacit. Nevertheless, practice is a source

of raw data for architectural theory and a repository of architectural knowledge. Professional practice as locus for observation and inquiry, is offering a crucial position in the mediation between the world of ideas and the world of building. It benefits of a unique relationship with stakeholders, their contexts, and their needs and beliefs. Unravelling the argument of underlying pragmatism and participatory digging into processes of interacting agents will 'make architecture speak'. (TILL, 2007)

Stimulating professional architecture offices to bring their operational know how in designing at stake as research, instead of only intending to be built, will lead to new insights in the processes of architectural production, and, even more fundamental, to a new profile of the architectural design research office[1].

Mastering architecture as an actor actively involved in its production through design, is a cumulative process of growing experience and personal development, which takes time. The collective body of mastery encapsulated in architectural practice possesses an immense capacity for innovation. This is another argument to investigate design as research situated in professional practice.

Leon Van Schaik talks about 'the broad but unacknowledged mastery in the work of practitioners who had been active for at least a decade'. By asking these practitioners reflect upon the nature of that mastery within a critical framework. Deliberated from the submersion 'into background noise by the sheer demands of practice', practitioners are reflecting upon the nature of that mastery within a critical framework, in order to bring them in conditions of transcending mastery, leading to innovation. (VAN SCHAIK, 2005)

Academia seems to be a good biotope for two quite diverse types of research. On the one hand one can notice the fast development and growing impact of computational scripting, parametric design, bio-mimicry and the like - close to mathematics, engineering and sciences, at the same time often

1 Cases in point are initiatives as the 'Stimuleringsfonds voor Architectuur', today called 'Stimuleringsfonds Creatieve Industrie' ('Creative Industries Fund NL'.) and 'Architecture Workroom Brussels' by Joachim Declerck.

bridging to the arts (visual and other); on the other hand architectural theory and history - connecting architecture to the humanities and social sciences - appeared to be the most susceptible and fertile field to the general request to 'academize' the discipline, in the sense of ' a better embedding in research' as well as in the sense of an increase of the production of research outcome.

But the discipline cannot do without architectural design being the backbone of architectural education and the central and distinguishing feature of the profession and the discipline. As a field of action, and a perspective for research, design offers itself as a way for experimentation and exploration into, by and for architecture. Developed in a way of learning-by-doing and embedded in the specific DNA of various Architecture Schools and Professional Practises throughout Europe specific characters are emerging, approaches become apparent, scopes are taking shape.

PHD research, typically situated within the walls of academia (except the approach of Leon Van Schaik at RMIT) renders its own scope. Murray Fraser classifies the typical broad-brush range of PHD-type studies that one comes across at the Bartlett into four categories (although, Fraser states, 'as with all classification systems always rather provisional and uncertain'): (1) those which look at more 'internal' matters such as issues of architectural discourse, meaning, representation; (2) those which seek instead an interdisciplinary practice, or cross-disciplinary practice, with 'external' subjects such as art, photography, design, curatorship, anthropology, philosophy; (3) those which pursue a far more technological or sustainability or fabrication trajectory as their theoretical basis; and (4) those which aim to be located in some kind of mediated practice or 'live' practice work in the world outside academia. These categories of course, as with all classification systems should be considered as rather provisional and uncertain. It also should be clear that the real attraction of design research is precisely because it is so diverse, complex and emergent in its approach[2].

The Sint Lucas School of Architecture in Ghent/Brussels organised - based on the initiative of Johan Verbeke - during the

2   Exchange of thoughts, e-mail of Murray Fraser 22 May 2013

past eight years three international conferences addressing the issue of the PHD in Arts and Architecture. The series started with 'The unthinkable doctorate' (BELDERBOS & VERBEKE, 2005), which was followed by Communicating (by) Design (VERBEKE & JAKIMOWICZ, 2009) and Knowing (by) Designing. (VERBEKE & PAK, 2013) The conference proceedings of all three conferences serve as an excellent overview and reference for what one could call design research directed to creative practise in the arts, including architecture, music and visual arts.

At the University of Antwerp the proceedings of the conference Theory-by-Design, Architectural research made explicit in the design studio (DE VOS, DE WALSCHE, MICHELS, & VERBRUGGEN, 2012) explore the scope of knowledge and insights that (only/typically) design can generate and transfer, by presenting a broad range of case studies regarding studio teaching by design. Based on this overview Johan De Walsche discerns (provisionally and at least) seven purposes for design to be the appropriate way for generating the insights that where aimed for: (1) design as a specific case of creative practice, revealing insights that can be grasped only within the mental and/or bodily condition that is caused by the activity/experience of designing. A special case of this kind of design research is 'developmental', meaning that it is intending to improve and innovate the design process itself; (2) design through making (for instance of built proto-types and physical demonstrators), revealing insights that can be obtained only by interaction with the implications of materialising; (3) (computational) design experiments, as a way of exploring, rediscovering and redefining architecture as mimesis of nature; (4) design as (virtual) prototyping, aiming at the invention and demonstration of new architectural/urban/ territorial models and typologies; (5) design as a vehicle/tool for the analysis and exploration of architectural/urban/territorial issues; (6) design as spatial scenario writing in order to evaluate future realities (anticipatory design research); (7) design as a way of conducting action research, aiming at a evaluating, documenting and developing processes of intended (societal) change.

At the Delft Faculty of Architecture, the debate on research by design is flanked by the of several specific architectural research approaches, established in the frame of the Department of Architecture. [1] Hunting & mapping aims at gathering yet unknown substance, for example the public realm in situ, and ordering themes and substance by visualizing them. Instruments applied are tools, like writing and sketching, street photography, interviews, data collecting and the like. As in Antwerp, scenario writing & drawing elaborating the 'narrative'

and position with regard to theme, site, program and future reality is considered a valuable tool within the research and design process. [2] Plan analysis, the comparative study of built prototypical precedents (and/or oeuvres of architects) focusing on canonical buildings are regarded as means to enlarge designer(ly) knowledge in order to bridge the gap between analysis and design. [3]Typological research interprets basic building configurations from both historical and contemporary paradigms. This research investigates foremost the typological features of buildings and urban blocks and their immanent, tacit qualities. Understanding the way, in which certain architectural typologies and models[3] transform through time, renders additional knowledge on how to manipulate, reuse, recombine and transform existing typologies to arrive at new ones. Moreover [4] typo-morphological research addresses the physical structure of buildings, blocks, cities and territory on different scales. It helps to understand the historical transformations of types and models. [5] Morphogenetic research deals with the performance of architecture, in regard to use, reuse and transformation, and everyday life and its practice through time. This research poses the question how the actual use influences the buildings and spaces, and vice versa. [6] Phenomenological research addresses the way in which architecture is perceived. It addresses the composition, tectonics and material qualities of the architectural design, including colour and ornament and the impact of art. Within the design process addressing the (future) perception of architecture always is speculative, based on unproven evidence, i.e. intuition combined with reason. This approach rejects prescriptive methods but instead embraces capabilities like free association, sudden leaps, inversion of times, mimesis and the like. (CROSS, 2011)

3   Castex et al. define the architectural model as the actual architectural project, based on specific rules, concepts and techniques. Various projects may share the same rules and techniques resulting in distinguishable architectural or urban planning models. On could say, in each plan and design, forms and operations are expressed that structure their composition, which refer to a set of concepts, references and specific techniques that serve as the basis for the design.

The aim of this meeting, being the first in an ARENA series on 'method' in design research, is to filter and sharpen the agenda of next meetings, which will focus on evidence by good practice as a result of matured and convincing approaches on PHD level and/in more or less established/defined research contexts.

For this first meeting we invited scholars that (re)present approaches linked to the research practices in Delft that are listed above. They are mainly based on drawing as a research tool and as a substantial part of the research outcome. Two of the invited speakers, Carlos Dias Coelho from Lisbon and Pier Vittorio Aureli from The Berlage Institute Delft / Architectural Association London, operate in the field of typo-morphology i.e. urban form study. Marc Schoonderbeek, from TU Delft, explores mapping as a tool for research and design.

The FORMA URBIS LAB, Faculdade de Arquitectura, Universidade Técnica de Lisboa guided by Carlos Dias Coelho
The FORMA URBIS LAB of Carlos Dias Coelho is a group of researchers and PHD students that during the past years produced an Atlas of Squares in Portugal. 'A praça em Portugal' documents squares, which all are unique in their kind. With regard to urban 'squares', no comparable studies have been conducted since the analyses of Sitte.

The first volume of the ATLAS OF SQUARES starts with a theoretical, historical and methodological underpinning of the work. Additionally the introduction renders a short typological comparison of squares in Portugal, their history and background.

Each individual square is presented in the same way and on the same scale, ranging from an aerial photograph, photographs of the square, drawings of the position within the city stressing the network of public spaces, an axonometric, the floor plan and cross-sections.

Also within the PHD research the FORMA URBIS LAB operates on the interface between architecture and urbanism. Next to the Atlas work on squares the PHD students of the lab develop their individual research, which is related to morphological transformation of urban artefacts (streets, building blocks...). They try to depict the actual architectural composition and design solutions, and look for underlying design paradigms dealing with specific circumstances, for instance heights differences within building blocks due to topography. Moreover, following Castex the research lab is interpreting the inner logic that links the design to societal change.

Basically the research of the FORMA URBIS LAB renders knowledge that is relevant for a broad range of contemporary design questions. For example, how to value the development and (non)design of certain 'modern' squares, shopping streets, building blocks and areas. Moreover the research approach of the lab allows speculation on for example the historical, lay-out of cities like Evora and Lisbon with regard to whipped out traces of the former positioning of mosques, amphitheatres and the like, in this regard even supporting archaeological research and, in the long run, contemporary tourism.

'The City as a Project' PHD group of the Berlage Institute Delft, supervised by Pier Vittorio Aureli

Also the work of the PHD students of the Berlage Institute centres on architectural drawing as a solid ground for architectural evidence. Its main focus, according to Pier Vittorio Aureli, is the interrelationship between architectural form, political theory and urban history. Aureli understands urban form as a highly politicised instrument of power. The work of the PHD students centres on the generic, the common in urban architecture. Generic building types, urban blocks and other artefacts are understood as paradigms that need investigation and understanding with regard to their political means, re-evaluation and in the end re-appropriation by the people/architects to allow changes in production and political life.

The program allows the students to follow their personal fascinations for analysis. For instance the architectural configuration and meaning of the Via Appia in Italy, is studied, or the Athens' frequently occurring building type of the urban villa. Applying meticulous drawing on a variety of scales together with written and historical sources, the work documents and interprets the historic form and genealogy of the design up to its actual appearance. Moreover the research perspective of the program questions how building type and urban form influence or even determine life of city inhabitants and, by the specific division between private and public, allow or repress political life and subsequently socio-economic change. To arrive at options for change, speculation is applied in the form of questions/drawings that render 'The possibility of....' or 'What if.....?'. This allows for elaborating alternatives for a possible future, offering additional knowledge and viewpoints, eventually acting to change the political meaning of urban artefacts. In a way Aureli's approach is a continuation of the approach of the Warburg Courtauld Institute Hamburg/London, where the architectural historians Rudolph Wittkower,

and later Colin Rowe developed a methodology based on extensive documentation in drawing and text followed by an interpretation of both sources. Additionally, speculation is/has been applied to arrive at new insights.

The 'Architecture; Borders & Territories' research group at the Faculty of Architecture and the Built Environment, Delft University of Technology, coordinated by Marc Schoonderbeek
The research activities of the 'Architecture; Borders & Territories' group, coordinated by Marc Schoonderbeek, focus on the emergence of the architectural project and its related theories. Their research explores architectural design as a process in which contextual readings are considered of vital importance. In terms of analysis, this means an understanding of the architectural material itself as being crucial for the process of projecting the characteristics of the work to more general theoretical insights. In terms of a design process, a clear delineation is proposed with regard to the way in which contextual information (in)directly determines architectural design processes and as a consequence, ultimately 'constitutes' architectural form. The group describes this process as an 'internalization of the external'.

The B&T research involves three main fields of interest, namely a clarification of the discursive field in which architecture nowadays operates - including the 'borders' of the discipline -; the development of operational tools with which the architectural project is conceived (mapping, literary techniques, sampling, etc.); and the careful consideration of the representational techniques with which these processes of operationalization, both on the level of theory and design, occur (for instance the formal language developed by Tschumi in Manhattan Transcripts).

The architectural project is not considered as an object of study that continues a specific historical discursive tradition, but as a generator of the 'new'. The basic premise behind this line of thinking is that the 'catalogue of possible architectural forms' is neither complete nor exhausted. In this research, therefore, 'other' possibilities of architecture are addressed, by speculating on the relevance of (1) the use, appropriation and application of methods and tools that come from outside the discipline (cartography, literature, art, philosophy) or (2) those architectural objects and projects that have, until recently at least, not been considered as architectural 'material' as such.

Mapping, which will be discussed during the keynote-lecture, is considered particularly relevant in this context. By considering mapping as both a design tool and a research tool

simultaneously, mapping avoids the banality of problem-driven design. In contrast, it opens the design process towards the incorporation of the subjective. The 'place-time discontinuity' of mapping provides the possibility of speculating upon unexpected relationships and different meanings of architectural work.

Finally, Johan Verbeke provides an overview of the way in which Research by Design indicates a paradigm shift within architectural research, education and design practice. After a long search of approaches and methods – derived or 'lent' from a extensive field ranging from humanistic disciplines reaching from sociology to architectural and art history – Research by Design in all its forms proved to meet the specific character of architectural design as theory and practice. Especially in architecture schools springing from a beaux-arts tradition, i.e. an artistic background, this approach opened up avenues for several ground breaking academic PhD programs in Belgium, UK, Scandinavia and Australia. However, notwithstanding of Research by Design becoming of age and rendering several modus operandi an array of problems still has to be catered to. On a European level, for example within the Horizon 2020 funding, proposals for architecture research and training programs still have to apply in either the categories of technical sciences or humanities. In fact, currently there are no categories to fill the gap. In addition, casting a new light on combining engineering and artistic traditions and 'designerly' thinking remains a challenging issue that deserves further elaboration in the near future.

Johan De Walsche, Susanne Komossa
October/November 2013

Bibliography

Bayazit, N. (2004). Investigating Design: A Review of Forty Years of Design Research. Design Issues, 20(1), 16–29. doi: 10.1162 / 074793604772933739

Belderbos, M., & Verbeke, J. (2005). The unthinkable doctorate : proceedings of the colloquium 'The unthinkable doctorate' at Sint-Lucas Brussels from 14–16 April 2005. Brussels: Hogeschool voor Wetenschap & Kunst Network for Theory, History and Criticism of Architecture.

Cooper, R. (1997). Design Research Comes of Age. The Design Journal, 1(1), 1–1. doi: 10.2752 / 146069297790219431

Cross, N. (1982). Designerly ways of knowing. Design Studies(4), 221–227.

Cross, N. (2011). Design thinking : understanding how designers think and work (English ed.). Oxford ; New York: Berg Publishers.

Crysler, C. G., Cairns, S., & Heynen, H. (2012). The SAGE handbook of architectural theory. Los Angeles, [Calif.] ; London: SAGE.

de Jong, T. M., & van der Voordt, D. J. M. (2002). Ways to study and research : urban, architectural, and technical design. Delft, The Netherlands: DUP Science.

De Vos, E., De Walsche, J., Michels, M., & Verbruggen, S. (Eds.). (2012). Theory by Design, architectural research made explicit in the design teaching studio. Antwerp: Faculty of Design Sciences, Artesis University College, Antwerp University Association.

Fraser, M. (2010). Architectural research comes of age. Arq-Architectural Research Quarterly, 14(1), 8–9.

Fraser, M. (Ed.) (2013). Design research in architecture : an overview: Ashgate Publishing Limited.

Horst, W. J. R., & Melvin, M. W. (1973). Dilemmas in a General Theory of Planning. Policy Sciences, 4(2), 155–169.

Janssens, N. (2008). Designerly thinking and research. Reflections, 7, 203–211.

Latour, B. (1993). We have never been modern. Cambridge, Mass.: Harvard University Press.

Lawson, B. (1994). Design in mind. Oxford [England] ; Boston: Butterworth Architecture.

Serres, M., & Latour, B. (1995). Conversations on science, culture, and time. Ann Arbor: University of Michigan Press.

Technische Universiteit Delft, F. B. (2001, November 1–3, 2000). Research by design : international conference November 1–3, 2000 : proceedings. Paper presented at the Research by besign, Delft.

Till, J. (2007). What is architectural research? Retrieved 27 september 2012, from http://www.architecture. com/Files/ RIBAProfessionalServices/ ResearchAndDevelopment/ WhatisArchitecturalResearch.pdf

Van Schaik, L. (2005). Mastering architecture : becoming a creative innovator in practice. Chichester ; Hoboken, NJ: Wiley-Academy.

Verbeke, J., & Jakimowicz, A. (Eds.). (2009). Communicating (by) Design: a joint publication of Chalmers University of Technology and Hogeschool voor Wetenschap & Kunst - School of Architecture Sint-Lucas.

Verbeke, J., & Pak, B. (Eds.). (2013). Knowing (by) Designing: LUCA, Sint-Lucas School of Architecture Ghent/Brussels and KULeuven, Faculty of Architecture.
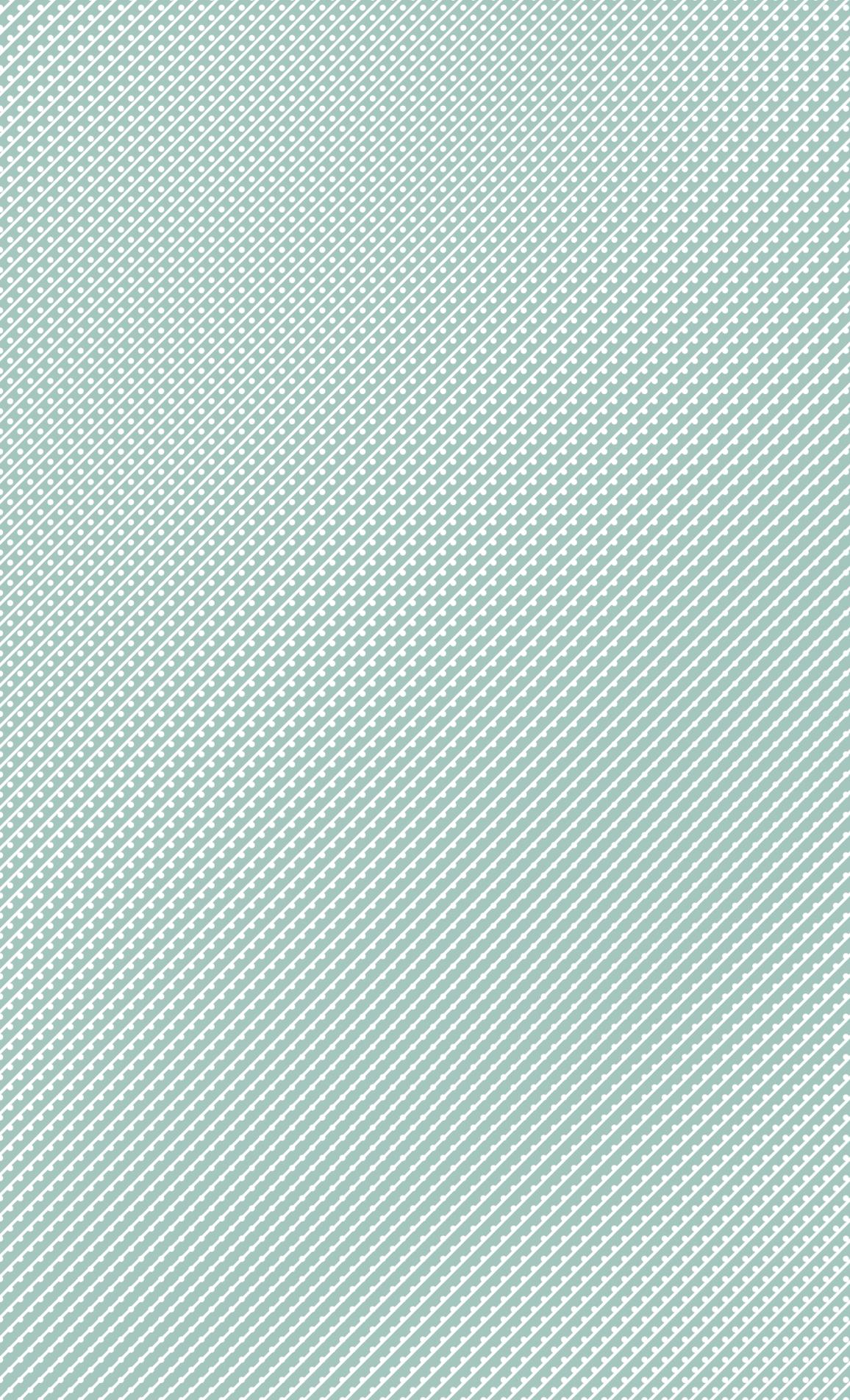
Learning from Architecture

Pier Vittorio Aureli
Lecture at the ARENA DR_SOM seminar at TU Delft, 01 November 2013
Transcription by Johan De Walsche

Architecture as Research

Talking about research, I have to start with a kind of personal 'confession'. When I was a student I really hated research. I always thought it was a huge waste of time and I always wondered why I had to spend all this time gathering information, working on studies that might turn out useless. So I had a deep skepticism towards this word, and the whole ideology that was very much associated with it, at least when I was a student. Indeed, in the nineties the word research started to emerge as a kind of fundamental key word of what schools were supposed to do.

Of course this skepticism augmented when I became student of the Berlage Institute, where the whole matter of research was even more emphatically celebrated.

At the same time, and that's a kind of contradiction if you want, I also believe that research is important. Research is crucial in order to avoid that architecture becomes a matter of INTUITION or even worse the OBSESSION of being a genius, or incredible top talent. I also believe that research is crucial to guarantee that architecture becomes shareable knowledge, that architecture is something not only about what I do, or what you do, but something that you can also exchange as a collective form of knowledge. So that is the reason why, in spite of my deep skepticism – which I think is still very strong – I remain committed to this practice of architecture as research, because it is the only way to escape the kind of ego-motivation that in the last ten years has made architecture basically a spectacle of personal signature, which as you know, is a complete mystification of what architecture is about. Additionally I think a school is a very strategic place to state the idea that architecture is a form of collective knowledge.

Learning from…

The title of this lecture is "Learning from Architecture". It is a kind of polemical title vis-à-vis the fact that during the last twenty years there has been a kind of hype with regard to this idea of learning form something else, starting of course with "Learning from Las Vegas". So, in a way, architecture has always been seen as the result of whatever content. In my experience as an educator, I always thought that, precisely by focusing on architecture in its most self-evident nature of a building, or a drawing, or a text has to do with the possibility of defining space, even the most innocent detail, even the most innocent and apparently technical architectural problem. It embodies, in its most tangible way, the way that the world is socially, culturally and politically constructed. Moreover the advantage of architecture is that the analysis can become very concrete, you can really focus on a tangible object.

Architecture as a Project

The question is "What is architecture?". In my work, I try to define an idea of architecture, or an idea of what architecture is about. Today, actually, I would like to define the idea of architecture, against the most self-evident understanding of architecture, which is, as you know, the act of building, or the practice of building. I would like to state that what discriminates architecture from the practice of building, is that architecture is always a PROJECT. For me this has always been the way to define the limits of architecture – not so much vis-à-vis all other disciplines, which is not always evident – but vis-à-vis the practice of building, which is of course the trigger for the way architectural knowledge has been formed, historically. Nevertheless we know that at a certain moment in history, more or less in the fourteenth or fifteenth century, this tradition has produced a new form of knowledge, where architecture was no longer a practice just through buildings, but through something that was much more complex, that is not reducible just to the fact of building, and that you could understand as an idea of the PROJECT, something that puts forward, something that does not exist yet. In fact it is interesting that the etymology[1] of the word PROJECT is the same as the word PRODUCTION,

1   project (n.) , c.1400, "a plan, draft, scheme," from Latin proiectum "something thrown forth," noun use of neuter of proiectus, past participle of proicere "stretch out, throw forth," from pro- "forward" (see pro-) + combining form of iacere (past participle iactus) "to throw" (see jet (v.)), Online Etymology Dictionary

(1)

to put forward, to bring forth. I think this is exactly what, at the end, the word ARCHITECTURE is about, what we have to understand as architecture, and what actually my work has trying to define as the REALM of architecture.

The Project
and its Media:
Text

I understood as the mediums of the project essentially two fundamental components. The first one is the text. I really believe that the architecture as a project is something that has always been defined not just as a PRACTICE but in fact as a sort of organization of knowledge itself. You shouldn't forget that Vitruvius wrote the "DE ARCHITECTURA LIBRI DECEM" as an ENCYCLOPEDIA, using the very specific format, which was very strategic in the way that he actually conceptualized the job of the architect. (FIGURE 1)

   Actually, this is the text, the letter written by Leon Battista Alberti to Matteo de' Pasti. The letter describes in detail the design of the facade of the church of Santa Maria Novella in Florence. As you might know Alberti never literally designed or drew his projects, he always wrote about them. In fact, what is interesting is that Alberti categorized the PROJECT, the way in which to practice architecture through the project, as the constant relationship between the principles of architecture, which are inherited through history. So for Alberti the principles for architecture are not transcendental, are not hidden, all for once, but they are the inheritance of a specific tradition. So it is very interesting to understand that the Albertian project of architecture is rooted in history. Not because of history as something simply to use or copy, but because it shows that what we understand as architecture is CONSTANTLY constructed and produced. At the same time the project also necessarily had to link the design issue to larger issues, like HABITS and CONVENTIONS, which Alberti describes in order to legitimize his idea of the project.

For me this is a very important aspect. Architecture without this text, without A text, cannot give THE architecture. In fact, in all my teaching I always insist on writing, not as a-posteriori legitimization of the design, but really as a way to start to define what are the TERMS of the project.

The Project
and its Media:
Drawing

The second medium, the second element is of course, the drawing. I do believe that drawing is not just an illustration of an idea, but is really a way of THINKING THROUGH ARCHITECTURE. Of course the specificity of drawing is not a matter of style, or making something different. But it immediately implies the way how to conceive architecture. I believe that one of the best definitions of architectural drawing is the one given by Rafaël to pope Leo X, when, for the first time, an architect really describes how drawing, architectural drawing, should be. Of course, at the time there was not yet a coherent theory on orthogonal projections, but Rafaël really insists on the VALIDITY of the drawing, that until then was seen still as a very strong abstraction of what a building is supposed to be. Nonetheless, the kind of language, the language of plans, of sections, and later on also axonometric, I still believe, constitute a very valid and critical way to understand, to practice and to think about architecture. Therefore in my teaching, I always insist on the precision of drawing. Drawing shouldn't look beautiful, or strange. It has to be shareable and it has to be comprehensible. And that's actually why I always insist on very simple techniques that nevertheless help the designer or even the researcher to understand the object of study, within the FRAME that I put forward with this explanation of the idea of the drawing.

Reflections

Now I would like to go through the research that I have been developing through the last, let's say more or less ten years, actually I started to teach exactly ten years ago, in the 2003. I don't really like the autobiographical way of presenting work. I think it is a weak way of presenting something, but perhaps there is a time when a researcher has to take stock what he or she has done. This is not really a pleasant moment, because you see all the first problems and failures. Nevertheless, it might be useful in the context of this discussion, also because I don't want to talk about this issue of research and design in kind of abstract terms, I found this kind of discussions, when they become too abstract, not really useful. But in the current presentation, I think the best way

is to really show the work and see how the work basically unfolds within the premises it has been put forward.

Teaching

My teaching activity has started actually when I was still very young, at the Berlage Institute, which doesn't exist anymore. Since I was actually given this possibility to teach, I tried to start not with a kind of one half topic. I tried to think: if I would survive at least three years of teaching, what would be the topic, what would be the idea, that would allow me to have a certain continuity, and therefore accumulation of a certain KIND OF KNOWLEDGE. I think this is the importance when you do research – and that is really the idea of a PROJECT – that you always try to think on long terms. Even after the first years you discover that what you were doing, was not really successful. I think that moment has happened to me, sometimes. So you can come to the conclusion that you have to change the focus of your research. Nevertheless it is always an important issue, in either question of research and design, that there is a kind of long-term scale of projection of themes and interest. Today the universities, and schools in general, are very impatient in terms of supporting this kind of long-term things. It is more and more difficult to find a funding to have a long-term support. For researchers, in order to produce something meaningful, it requires a minimum period of three or four years.

Capital Cities

So the first issue that I addressed in my teaching work was the topic of capital cities. The reason why I chose this topic was the fact that is a clear and vital OBJECT FOR RESEARCH. Capital cities have played a fundamental role in the history of the nation state and globalization. They historically appear in a very specific moment of European history and also in world history. At that time – I'm talking about ten years ago – this kind of an idea expressed through strong CENTRALITY, was a very unfashionable topic; at that time there was a lot of emphasis on SPRAWL and on NETWORKS, all these kind of things that where really projecting the city as an almost disappearing artefact, as a disappearing place. So the choice of this topic was a challenge to that idea. It was also claimed that in spite of the decline of the nation state, the city as a locus, as a place, actually, was still very important. The political events of the last years, I mean the economical crises, political upheavals and also counter-projects, seemed to have proved this idea that the city in its most self-evident forms, still matters.

29

Cities of Labor

The next topic evolved itself within capital cities. It was the relationship between labor, city and architecture. Actually by studying capital cities, which were one of the most radical expressions of modern urbanization, we discovered that it was impossible even to think about the city without thinking on the role that the forms of production have played on development. So already in the capital cities research, it became evident to us that we had to shift the focus from the idea of place, to the subjectivity that has inhabited that place, which is in fact the subjectivity of labor. Within that, let's say, metaphysical theme, instead of actually focusing on cities, the research started to focus more on TYPOLOGIES, on specific archetypes, ARCHITECTURAL ARCHETYPES. So it became less place-related, and more specific to the architectural ARTEFACT. This is actually also very much in line with what I do now at the AA.

The Architecture of the Sacred Space

In fact there was now a third emerging topic, which has emerged inside and within this interest, which we have started now. It is the architecture of sacred space. This topic has become very important for me, because, in a sacred space is a fundamental sphere, which we see as the origin of many URBAN PARADIGMS, and even URBAN ARCHETYPES, that have characterized the evolution of the modern city. It is interesting to note the sacred space is one of the most neglected fields of study within the recent history of urban research.

The 'City-as-a-Project' PhD Program

The PhD program "the city as a project" – which I led starting from 2009 – was for me a kind of summary of this research. It was a way to actually go beyond a studio-like, design-like approach, and really to question the theses of this metaphysical project. Of course within the PhD program, the contribution of the researchers, made it even stronger. They forced me to also question many of the categories and concepts that were at stake in these project.

The projects: Method of Editing

Now I would like for the rest of the lecture, guide you through some of these projects. I will show you a few images, just to give an idea of how this research was produced, what was the outcome, the content. But I am also very interested in the

(2)
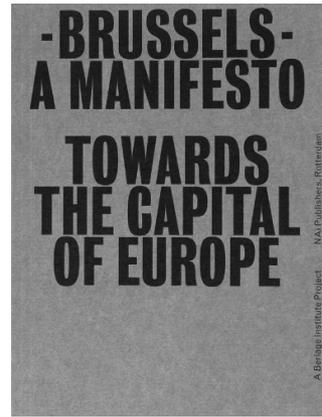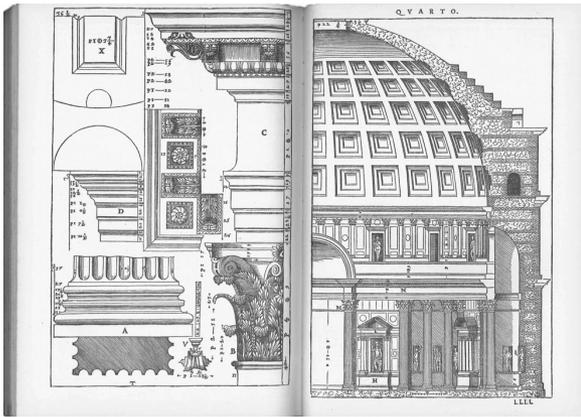
(3)

methodology, the way of production. This was very important in constructing this mode of research. The first thing was that from the very beginning, I really insisted on the fact that the students' research is not just writing a statement, or making a project, and ending in a kind of lose power-point presentation, but to write a book — writing a book, meaning, not just to write a book, but to EDIT the research. For me this aspects of editorial work is crucial: the fact that you do not simply just have a great idea, and the idea is there, but that you also try to present that idea through text, through something that can be shared, that can remain. For me this is very important, and I always insisted, and still insist that my students, that this editorial work is an integral part of the architectural project. You just have to look for the four books by Palladio, and see not only the beauty of the layout of these books, but also how the specific layout, the specific presentation really convey the very intention of the project. (FIGURE 2)

I organize the research in a way that the students of the same year work together as a group. This is also because I was teaching postgraduate students, so I expected them to have a certain skill of collaboration. This is as you can imagine, one of the most difficult things to maintain, for obvious reasons, because we are all unequal and I am the last to diminish this importance. But at the same time, as I said before, architecture is also very collaborative. So, for me, this idea that the students would work together as a group –which was at the Berlage Institute at that time quite unprecedented– was very important. The second thing was, that every year the project would be presented as a book. (FIGURE 3) So the issue of the book for me was really not just a way to publicize the project, it was the real FORM OF THE PROJECT. I mean that I am really convinced that the BOOK is a for us the ESSENTIAL FORM OF ARCHITECTURE, which distinguishes architecture from, as I said before, the practice of building.

Brussels

The first book was this one, a book about our project on Brussels, which at that time was becoming and is still becoming, a kind of fancy capital of Europe. For us, the fanciness of the city itself was the best non-rhetorical portrait of the fanciness of Europe itself. Also, the project was initiated in a very specific historical moment for Europe, which were the early referendums of all the European institutions. They were a trauma for the European project, because most of the nations basically rejected the institution. So it was really a moment in which this kind of euphoria for Europe collapsed. It was shown that there was nothing behind the pure fact of the economic aspect, framework of this European project. So the project was not just to propose a specific, a site-specific, project for Brussels – where Brussels could be a tangible representable capital of Europe. The project concerned also the construction of the European project itself – seen through its original motivations, but also through its historical legacy, expressed through, of course, the capital city of Brussels. One of the most tangible proofs that there is such a thing like a European culture and a European political framework, is exactly that Europe has produced very specific urban archetypes, which and not just an esthetic appearance of the city, but also imply juridical, political and social issues, that are crucial and that have been shared by many countries. So you see that the project was a kind of reconstruction of this history – history not as a way to LEGITIMIZE the present, but to QUESTION the present. At the same time the project was really written, and the whole book was done through formulating THESES, by a series of propositions. Of course, I was very much inspired by Oswald Matthias Ungers' BERLIN AS A GREEN ARCHIPELAGO – a project, which for me was an incredible inspiration from the beginning of this study (FIGURE 4). You might know this project, one of the most interesting aspects is that it contains only a few drawings, the whole project is a series of theses. I always thought that this kind of constructing a project was very powerful and inspirational.

On Presentation

Of course also the aspect of PRESENTATION was very important. We felt that there was a need to RE-INVENT or RE-DISCOVER a way to present the project, that would not rely on, what at that time were those kind of endless productions of bad, tricky images. The whole idea was to rediscover the idea of a line-drawing plan — a very straightforward kind of architectural drawing that shows the importance of the plan in expressing the idea of the project. At the same time, we also took a lot of time to invent a new visual language for the project, for example using the collage.

(4)
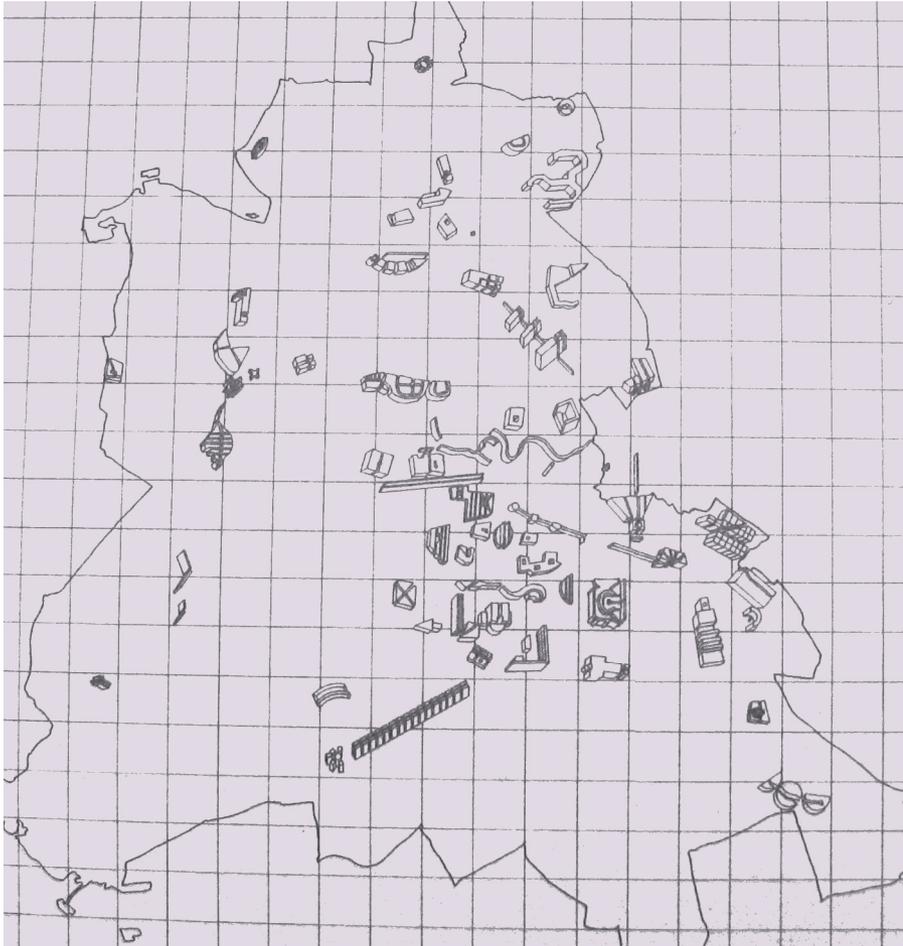
Sometimes collages actually precede a project. In fact by putting these projects again in circulation we got a kind of architectural repertoire that was not concerned with inventing something new, but basically meant constructing by using the RUINS, if you want, of the past. Of course this is a kind of approach, to which I am also very critical, because it can end up into something very misleading. Nevertheless for us it was very important, because it was a way not only to reinvent the MOTIVATIONS of architecture, but also its PRESENTATION. I think the investment in representation, in drawing, was extremely important. This care about drawing, was a way for me to slow down the creative potential of students, who are very often overproducing stuff. So the whole idea was to ask students to produce as less as possible, two or three drawings, but to really take care of this material, and to use these project to ARGUE something, rather than to simply end up in the kind of endless story where, when you arrive to the conclusion you don't remember what was the beginning.

Rome

A next project, in fact the third one, but the second which was published as a book – actually from all these projects we have always produced a book, but we're not always be lucky to find a publisher or a funding to support the publication of these books – was the project for Rome.

Compared to the previous one, this was a very interesting experience. In this case of Rome we have been more precise in the sort of urban analysis, of the way the city was developed through nothing more then its road system. Rome really is a very, let's say, "chaotic" city, but it has one logic, which relies on the architecture of the street. It is interesting that the last regime that has used the street as a kind of city making principle was the fascist regime. That's the reason why after the former fascist regime, for obvious reasons, the street as a city-making tool within the city, became like a taboo. So the whole research project in fact was to rehabilitate STREET MAKING as a principle to create a possible urban form, for a city that in fact has not known development in a conventional way for at least 50 years. This was a project were history was really a METHOD OF DESIGN — not by translating history in design, but by finding in the historical developments, the typologies that have created the problems that affect the present.

The Construction of Subjectivity, Infrastructure as Economy and Production as condition

This Rome project was also the project were another issue became very important for us: the construction of SUBJECTIVITY. Till then, this issue was not addressed in the research, but it was at this point that we felt that in order to define an architectural project for the city, something that we have to clarify is WHO IS THE SUBJECT of this project. Of course, the subject is not a social group or a specific group of individuals, but is a sort of historical and political construction, that nevertheless manifests itself through very specific paradigms. We thought that a fundamental paradigm that can define contemporary subjectivity was actually what Jeff Wall? shows in this famous artwork, which is called "young workers". (FIGURE 5) It shows the contemporary worker who actually has lost the traditional attributes of the Fordist-worker, but nevertheless has become one of the most ubiquitous phenomena that define our civilization. The fact that work and life have completely blurred their limits, have become a fundamental sphere for architecture. It was precisely within this project that the problem of INFRASTRUCTURE, the problem of MOBILITY – not seen just as an architectural problem, but as an economic distribution of the city – became very important. So in a way, this project was also a way to overcome the kind of urban schism that we had in the previous projects against issues like network mobility, and being very interested in form. So this was the first project where we reintroduced notions of political economy; how to – basically through architecture, through a specific architectural project – address the economic and social construction of the city. Compared to the Brussels project, this project for Rome lost perhaps its kind of radicalism in terms of presentation, but became for us important to understand the mechanisms that produce the city, and that, for us, had to do with this phenomenon of PRODUCTION, and how production is no longer situated in a specific place, but is a kind of totalizing condition of the city.

Athens

In this project we studied the issue of typology, the issue of reforming not only the city at large, but also the micro scale through which the city becomes tangible, its ecological framework. In this project also the idea of REFORMATION OF DOMESTIC SPACE became extremely important. In fact, it was precisely at this point where the issues of labor and production had become a fundamental concern of the research. Moreover, this concern for labor and production became very EVIDENT in the last studio I taught at Berlage, which actually focuses on the city of Athens.

35

(5)

This research was still part of this capital city project, but something different was emerging, which was no longer this large-scale project of the city, but more the understanding of the city in its most minimal particles, as a kind of index of a construction of a very specific subject. Of course, Athens for us was a paradox. It is one of the most fragmented cities that exist in Europe. Apart of the ecological items, the whole city of Athens literally is completely fragmented and made of one specific rather flexible type, the polykathoikia. In the nineties, Athens was very much celebrated as the ideal plan of the former city. But at the same time, we also discovered that this specific fabric, which literally carried the urban form of a patchwork of generic grids, was made by one single type – polykathoikia – which was in fact a sort of an application of the domino model by Le Corbusier. We realized that within this kind of space type, a specific place logic was at work, which was the way in which a series of state driven initiatives, of liberalization of the housing market, was very specifically creating petit bourgeois inhabitants, completely disconnected from any sense of the city, completely disconnected from what was not just their private property. This is very specific for the history of Greece. Post-war Greece has a very specific history, with very specific projects. And what actually looks like chaotic and informal, in fact was the embodiment of a very specific tactic. A way to understand this logic was not just to study this process – which actually was already addressed by scholars who actually had already produced critical accounts of the city of Athens – but also by drawing the fragmented city. By using drawing – the most innocent and banal medium that architects can think of – we could understand how behind this informality, there was a strict logic at work. For example every block would be literally fragmented by this typology. There is almost never a courtyard, or when there is a courtyard, it is always completely an abandoned space, because the typology really neglected the possibility of having that kind of common collective space inside the city block. Also the use of the 'Stoa' would never be integral, it would always be fragmented and therefore destroy any sense of continuity from the level of the street.

   In this study we really went down to the small scale to understand the large, let's say 'lessons,' of the city. This was also the way students approached the design: still they were actually proposing a large scale strategic plan for the city; yet, the deal was really to investigate small scale typologies that would reconstruct – out of this fragmentation without denying it – a sense of collective space that would in fact emphasize how even domestic space, the space of reproduction, is part of this large common space, the space of production.

From Design Studio to PhD program

So, in a way these three very short accounts of what we did, give an idea of what was at stake in the studio research that we were developing during the last years. But I have to say that all this for me became much more clear and conceptually elaborated from the moment that I had the opportunity to move these attempts from the studio activities – which of course have a very strong limitation, which is a limitation of time, and the fact that in the end we always have to arrive to a proposal, which sometimes is good, but sometimes also limits the possibility of a research really to arrive to conclusions where architecture is not enough, where you have to invest on a much larger scale of issues. So for me the PhD program was a very important opportunity to make this jump.

"The City as a Project",
Reflections on a PhD-program

First of all the idea was that the PhD program would not be a handled loosely as a gathering of different theses. The idea was exactly to learn from the experience of the capital city studio. To have a research group means to find a balance with a collective ethos in the group. This I learned from my experience as a PhD researcher, which was one of the saddest experiences of my life, because I was all the time alone and missed the confrontation with others. What I proposed was to hire a certain number of PhD candidates, all of them more or less at the same time, through a kind of selection process. There was a clear brief of the PhD program, which was called "the City as a Project". The brief made clear that the theme of interest of this program was the relationship between urban form and the political. So in a way it was a call for papers, if you want. But at the same time, I took care that the topic was generic enough to leave space for different interpretations. In the "City-as-a-Project" program the idea was that we would meet regularly, twice, sometimes even more, every month. At each meeting every candidate would present his or her research, and we would often have an invited scholar to present us his or her work. So the whole idea was to have a GROUP that would constantly SHARE the research. Through this collective way of working, a series of themes, categories, emerged across our discussions, like for example the idea of TYPOLOGY or the opening of the question of CLASSICISM. It became very evident for us that it was not possible to only relay on the architectural knowledge of the nineteenth century, if you really want to understand what is the purpose of architecture. It is not only the regeneration of architecture but we had also look into RENAISSANCE ARCHITECTURE as a fundamental chapter. We are not historians,

and of course historians would have a lot of problems with our kinds of assumptions. As you know renaissance architecture, or everything that is architecture history before the nineteenth century, has become the field of extremely accurate scholarship. At the same time the scholarship is so accurate, that architects and practitioners are completely trapped in this literature. This is a fundamental problem, because we are missing a very important part of our knowledge that has become so hypertrophic in terms of information, that we cannot understand it any more.

Actually one of the challenges of this project was to look whether for us as architects, even as a PhD in architecture, it was possible to re-read this text, to re-open this kind of discussion, even from an awkward topic like classicism. Another very important topic, which is fundamental for the contemporary project, is the relationship between public space and common space. We are all aware how public space today is completely unable to redefine a possible meaningful collective sphere. In the last ten years, there has been an interesting discussion, trying not to eliminate the idea of public space, but to counter it with a different interpretation, centered at the idea of common space, which transcends the differences between public and private space. So for us it was very important to reflect on this category and to put it actually in the foreground of our research, especially because in the early capital city studios we had invested a lot on this idea of public space. At a certain point we really felt that it was becoming a kind of cliché. So we had to open up the discussion about the price of contradictive findings, which meant to loose also of a lot of research that was done previously. This is a very important moment. Research for me is always a moment where you have to experience the group beyond yourself. I mean even to the cost of contradicting something that was very important as a premise of the research itself. Off course it's a very painful moment, but it is also a proof that research is going somewhere, and not simply hammering on the same point.

Other issues were political philology – which in fact became important in the idea of sacred space – and last but not least, the relation between generic space and the space of production. This of course was already an issue that was very much discussed in the research on labor and the form of the city.

PhD research:
intelligence in drawing(s)

This work is now becoming a book also. Like in the previous exercises, the making of a book, not only of the different dissertations, but also of the collective work, has to materialize. It is something, which again, is best done in text, but also in drawing. So one aspect that was very important in this PhD

(6)
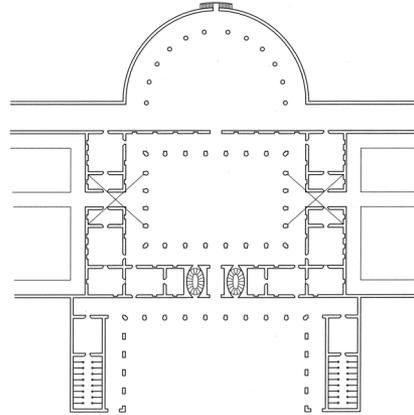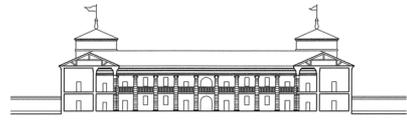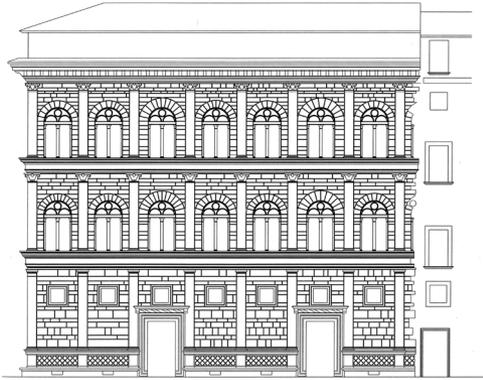
(7)

research was the role of DRAWING. I insisted that these PhD researchers would use drawing with equal importance as they would use the text, also because many of these researchers, are not just "one of these scholars"; they also want to maintain their own position as a practicing architect. Therefore for me the drawing was and is a way for reassessing the way that we as architects think not only through text or commentaries but also through the intelligence of drawings. These drawings reconstruct something that is not immediately evident in the traditional historical analyses. For example, these two drawings are very interesting. (FIGURE 6 AND 7)

    They were reconstructions of Brunelleschi's projects in Florence, and Palladio villas in the Veneto countryside. They show how these projects have always been addressed as a kind of singular monument. However in fact they unfold a very precise logic, which is the logic of specific cities and specific territories in a specific historical time. A drawing can also be extreme and RADICALLY SPECULATIVE. For example in this case, the logic of the villa Sarego. (FIGURE 8)

    Following the hypothesis of the text it addresses a territorial system. It allows a radical interpretation and helps the researcher to understand the logic of the object that he or she is studying.

0   50 Florentine feet   0   20 m

41

(8)
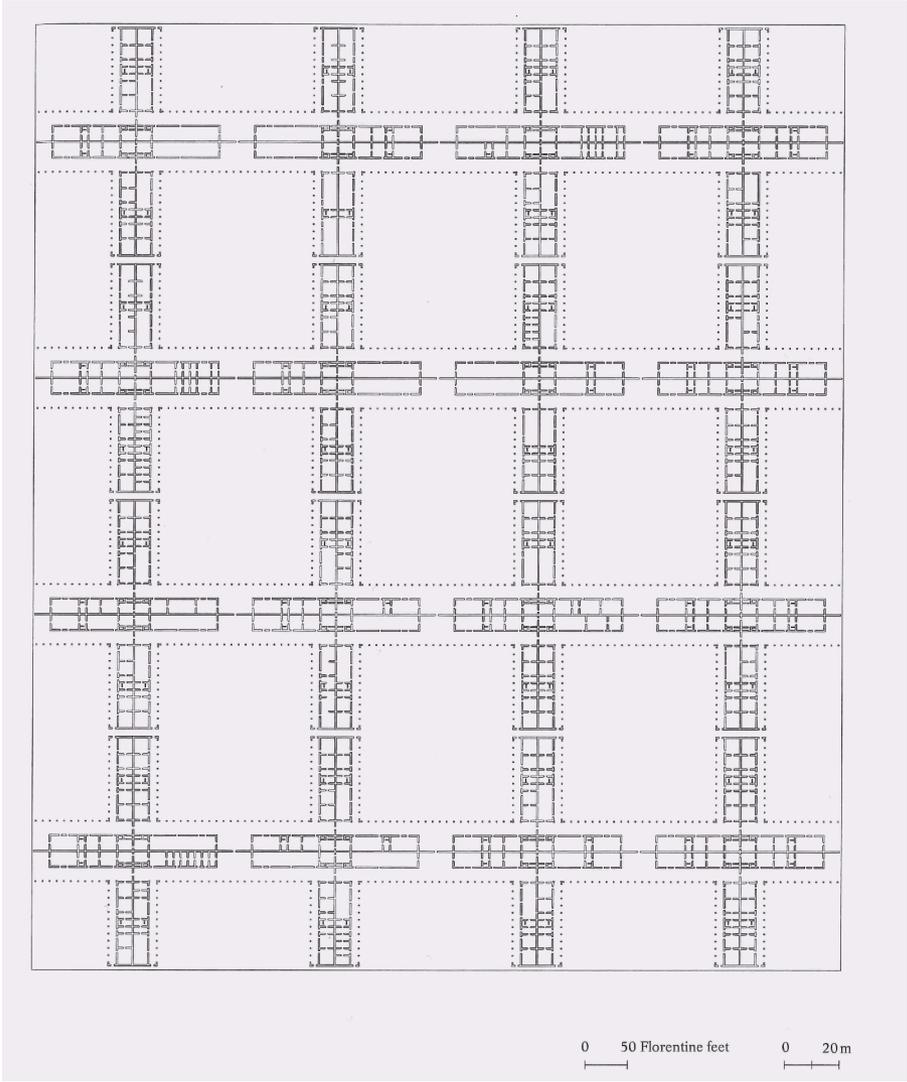
(9)
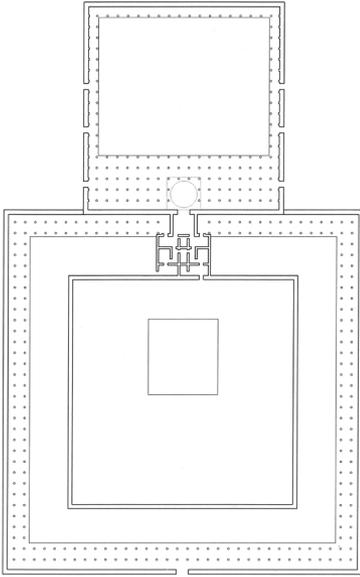
Social and Political Conflicts, and the Establishment of Form

Another important aspect is the relationship between social and political conflicts, and the establishment of form. One of the most extreme cases is the architecture of factories. It is a space that appears extremely generic. It is extremely normalized. However this normalization, this generic-ness should always be seen against the possibility to tame workers' struggles, and as a way to make them productive. In that sense, this is for us a very important aspect to understand how form is never PER SE, is never a tautological reflection on itself, but is always the outcome of very specific political and social forces. The architecture of the factory, especially because it looks so normalized and rational, is the best example of that kind of dialectics.

There is also the role of drawing, as a sort of archaeological construction of buildings and objects that have been always narrated a transmitted through literature, but that never have existed as an architectural drawing. As in this case for example, the reconstruction of mosques, based on archaeological findings of which we have lost basically the totality of the architecture. (FIGURE 9)

So following literature, following sources, the idea of redrawing provides actually to these findings a new architectural understanding, that is often very hard to read and find in the historical books about these examples.

Finally, within the work of this very interesting group is actually a research that investigates the formation of modern public spaces. By actually redrawing for example the Turgot plan in Paris – a plan that show the allotments of Paris in the seventeenth century – you

immediately see – and of course after reconstructing the parcelization of the block, that ofcourse is not evident with the Turgot plan, since it is an axonometric view – a fundamental problem of public space. It shows that public space was enacted, was defined, in order to legitimize, protect and nurture actually the fragmentation of the city. This is already evident in these plans, where you have this strong dichotomy between these large forms, clearly legible forms, royal squares, and the increasing fragmentation of the city fabric in marketable parcels.

In conclusion

So, in a way these examples actually do not show a series of final results, but a kind of approach that, I think, is still in progress. Nevertheless I had the ambition to rethink radically the way to understand the relationship between architecture and the city, or to put in other words, the city also understood as a political form. As I said before, the whole challenge, the whole purpose of this rather "fragmented panorama" – as Michiel Riedijk actually called it in the afterword of this book "The City as a Project" – shows the tension between the idea of the large scale picture of the city, and at the same time the impossibility of that large scale picture. This tension will always remain. For me this tension is the motivation to go on, and to insist on it. The purpose of this 'fragmented panorama' was also exactly why I set the title of this lecture to "Learning from Architecture', to see architecture not as a result of whatever content, but really as a starting point of the most tangible and concrete evidence of the way the city is politically, socially and culturally constructed.

Thank you very much.

The city as the model of itself

DIAS COELHO

Today, significant emphasis is apportioned to the relationship between research and project development. More specifically, this relays to how the disseminations of research can contribute to the outcomes and reflections of conceiving the city, and its engrained architectural composition.

It is suggested that this topic is one that is far beyond the phenomenon of tendencies that easily shift with the passing of time. In addition, this attitude is also one that contradicts the outlasting conceptualisation of the production of an entirely new utopian city, which in turn, would erase the existing imperfect city.

Engrained within the Faculty of Architecture of the University of Lisbon, the research laboratory FORMA URBIS LAB is exploring this subject matter. In addition, and due

to being composed of mostly architects, the scope of the investigation is never dissociated from the engrained composition and production of the city's framework.

The first issue that should be approached concerns the city that is our analytical object. A noteworthy extent of thought was allocated: (i) to the urban organisational models, which in majority, originate from the substantial amount of edification during the XX century; and, (ii) to the utopias which pursued the perfection of both urban form and organisation. Such efforts, however, fell short in meeting the delicate equilibrium between city form and that of socio-communal poise.

The expedition for this knowledge is not one that quests for the city with the perfect structure, with purely logistical schematics, nor with simple descriptions. On the contrary, this assessment is directed at the real city, with its inherent imperfections that continually transposes upon the daily lives of its users and aesthetically moves us. It is this reflection upon city dwellers that echoes its admired organisational complexity, and remarkably emphasises the capacity to be understood by the society it accordingly accommodates.

In this way, architects that contribute to the production of such form should firstly understand the city itself, which in turn, implies the grasp of its engrained physical dimensions, and production processes. Notwithstanding, this knowledge goes beyond the three dimensional spectrums that compose the physical

object. In this scope, the fourth dimension of time correspondingly plays a fundamental role in the characterising of any living object.

Such a city, one that is both experienced and experimented with, assimilates every era of its existence and actuality. Its streets, squares, blocks, buildings, monuments, spaces and overall organisation are the result of the progressive sedi-mentation of urban elements that have been successively reinterpreted and reassembled.
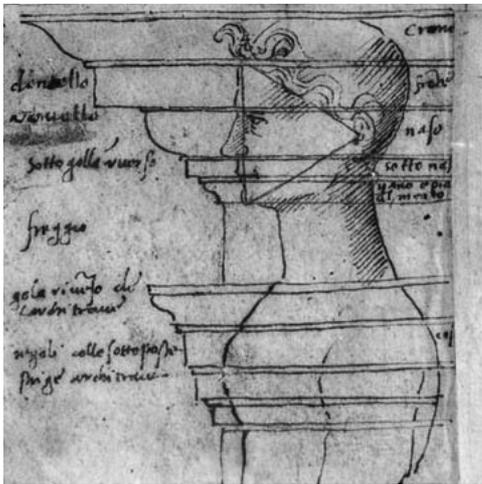
(1a)
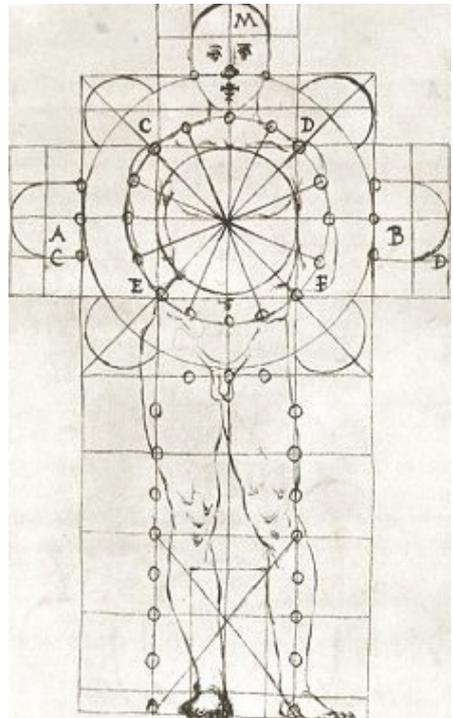
(1b)

Interpreting the city

One can thus question the relationship between the existing city and its interpretation, which resultantly, relates to its informed production. The fact is, if Painting during certain eras made reference to Nature, and Architecture strived to justify the canonical system of proportions in the human body dimensional RATIOS, the city has always used itself as a reference for its conception. (FIGURE 1)

During particular periods, the cities of Jerusalem, Rome, Paris and New York were primary references for the construction of the Western city. These specific and precedential cities were far from the crystalline nature of idealistic or utopian city models. Although bound by defects and problems, they nonetheless possessed a genre of complexity that surpassed that of any speculative model.

If one is to consider any specific city, one will promptly identify a multitude of spaces and buildings that might be integrated both in similarity or evolutionary lines. It is worth noting here that such examples are especially evident in more conventional urban components. These evolutionary traces are those that correspond to the production of intelligible components, and to the progressive adaptation of the respective societies that comprehended them. Only in this way can one explain the typological series, their temporal evolution, and finally, their moments of interruption and/or cessation.

As it can be conceived that the urban object that is incomparably richer than any urban model ever designed, it is through its interpretation and appreciation that one can contribute to its production. In this way, one shall stray away from the obsessive compulsion to reject the existing city due to the conscientious rejection of its engrained imperfection. Therefore, and as a first step, the formal quality of the built city should be accentuated in order to justify the need to study its urban fabric as an informer of its own production.

Qualities of the urban fabric

From the fertile arena of qualities and characteristics that can be attributed to the urban fabric (of which also include both experiential and aesthetic qualities), three exemplar shall be extrapolated: complexity, diversity, and identity. It is argued that these elements are those that clearly assert the formal richness engrained within the urban fabric.

Complexity

The difficulty associated to the comprehension of the urban fabric (and consequently its constitution), originated as a result of a fundamental misconception after the emergence of

urbanism as a discipline during the late nineteenth century. More specifically, the arrival of the discipline propagated the belief in total control upon the organisation and shape of the city from its very conception to its actual construction. Such postulation was the cause of significant city planning during the xx century, and whereby the discipline of urbanism would become a practice of an unalloyed science.

The act of controlling the city through the dependence on variables that are ultimately based on cause and effect implied a gross simplification of reality. Resultantly, this approach led to the confusion between an idealistic planning model, and that of actual veracity. This logic is disputably one that relays to the production of a building rather than that of a city. However, if such construction of a building can result from a simple relationship between a promoter and an architect, and within a temporal scope, the production of a city is an outcome of infinite interventions with divergent interests. These interests can moreover entirely contradict themselves, and furthermore, be distributed throughout considerably disperse temporal timeframes.

The urban fabric condenses events of very distinct periods and logic, which overlap and sediment trough time. These do not necessarily imply a chronological succession of intention, project and action, although such a conception process is not excluded.

The complexity of the urban fabric should not be dissociated from its production method, and associated temporal scope. The presence of such fabrics which suffer no sedimentation, and are a result of a wholesome intervention project, are an exception to this rule; and are frozen in the way in which they were conceived. Nevertheless, the question remains of whether such urban components shall resist the test of time, especially when buildings reach the end of their physical life, and as a result, have compulsorily to be replaced. Following this line of reasoning, various interrogations can be made: What shall remain of the urban interventions from the 1950´s and 1960´s for example? Which elements and reminiscence of these fabrics shall resist such sedimentary process? With the exception of fabrics that have resulted from very recent urban interventions, every exemplar reveals the sedimentary markings that might be displayed through the characterization of significant phases of formation of the urban fabric.

As an example, and referring to the case of Évora at a relatively fine scale (FIGURE 2), and using only the roman city and the existing context (i.e. the area within the old fence), one can verify the perpetuity of elements between these two periods. Such elements include the continuity of diverse constructive structures, alignments and markings of plots. The city's entire central area

(2)

corresponds to the successive long term reuse of the same space. More specifically, one can verify the location of the cathedral, palaces, or simple residential units as a result of territorial persistency, or in other terms, by the of the resistance of the composition elements of the urban fabric. In this particular case, the emphasis upon the roman forum's monumental structures is largely tangible.

The case of Évora is unique predominantly due to its clear evidence of a temporal sedimentary process, one which also includes more recent development projects in new urban areas. In such examples, the remnants of formerly established plots and structures are clearly identifiable.

The disclosed subject matter is intriguing not as much due to the renovation, and creation, of a new city, but especially due to the unblemished persistency of the structures during their transiency over various centuries. Additionally, one must note that some elements that lost their original existential purpose or functionality had the ability to be reinterpreted throughout the time.

Diversity

Presented by an object that is permanently developing, and whose results are from a process of divergent interests, wills and fatalities, it is natural that they considerably diverge from the purity of urban models. This takes place even in cases in which such models inform implementation measures at an early phase.

Although all of these occurrences are based upon a clear and coherent idea (i.e. grounded upon articulable, repeatable and simple premises), when one deliberates upon the built city, one can verify how a component of the urban fabric originated, and evolved, into differing urban manifestations. Furthermore, and for the same urban elements or compositional system, various distinct concepts and models were produced, by different authors and agents, hence resulting a broad scope of departure points for each of them.

This theme can be exemplified through the morphological inventory of squares in Portugal.

Based on the identified question, which refers to the urban square, from the approximately 130 cases identified and researched, each represented the urban square in Portugal in different territorial contexts, and each of the 130 squares presented different outcomes (FIGURE 3). Regardless of the scope of the research, or the number of selected cases, the same conclusion would inevitably be reached. One can logically organise the 130 squares by their respective typology, basic configuration, origin, or by any other classification and typological parameter. Notwithstanding, each correspond to different squares, as to be expected in the study pertaining to elements such as the "street", the "urban block", or any other for that matter.

Identity

The third quality that merits further examination into the understanding of the richness within the urban fabric results from the configuration of its various components that contribute, despite the specificity of each individual element, to the overall formal coherence of the urban fabric. It is this coherence that propagates the overall comprehension of the urban fabric's engrained identity. The capacity to understand a given fabric does not require its concrete knowledge; instead, it entails recognising the elements that compose it. This being said, local identity does not depend only upon the formal consistence of each element, but the articulation, and relationship between one another. It is in this permutation within the urban fabric that confers its unique characteristics and composition. Likewise, two distinct types of urban fabric, each with their distinctive identity, can share similar urban elements. The city of Lisbon distinguishes itself by its fertile

scope of urban identity amongst the city's diverse urban fabric. Following this line of reasoning, the city of Lisbon alone offers a broad range of examples that permit an in-depth examination into the concept of urban identity.

When comparing the samples of urban fabric and their engrained components, the cases of Alfama, Baixa e Alvalade (FIGURE 4) demonstrate a strong coherence between their compositional elements. More specifically, this logic can be acknowledged amongst the elements themselves, their formation and composition processes, and individual characteristics that all congregate into both an articulate and hierarchical relationship.

In this fashion, one can verify a dimensional relationship between the public spaces in each of the disclosed cases. However, it should likewise be noted that there is a clear contrast between elements from the three distinct urban fabrics.

The square of São Miguel in Alfama has practically the same dimension of one of the towers of Terreiro do Paço, and if it was located in Baixa, it would seem a formal mishap. However, the association of the square of São Miguel with the surrounding streets of Alfama permits one to grasp the square's prominence and reference due to its configuration, dimension and building characteristics. In the comparison between Terreiro do Paço with the square adjacent to São João de Brito's church in Alvalade (the square of Frei Heitor Pinto), although the two spaces result of a planned intervention project, the latter seems particularly disarticulated. Additionally, and irrespective of its formal regularity, the space lacks configurative preciseness. Nevertheless, in terms of its context with the fabric of Alvalade, the square adjacent to the church plays a clear role and contains a well-defined urban configuration. This is especially salient given its articulation with the axis of Avenida da Igreja - Church Avenue .

Regardless of the urban element at hand, one can verify the interlacing with the other elements enclosed in the same urban fabric and a smaller or greater maladjustment with the elements of other urban fabrics. This fact could be plausibly expected if it considered only the predesigned fabrics, where logically, the conception process aims at articulating its distinctive components. Yet, it also applies to urban fabric which is resultant of a slow sedimentation process, hence revealing its re-use and consequential re-interpretation, by either collective or individual operations, regulatory principals, or even territorial distinctions. It is here where the idea of a collective urban object is reinforced, and one which shall ultimately be expressed upon the actual urban fabric.

(3a)

(3b)
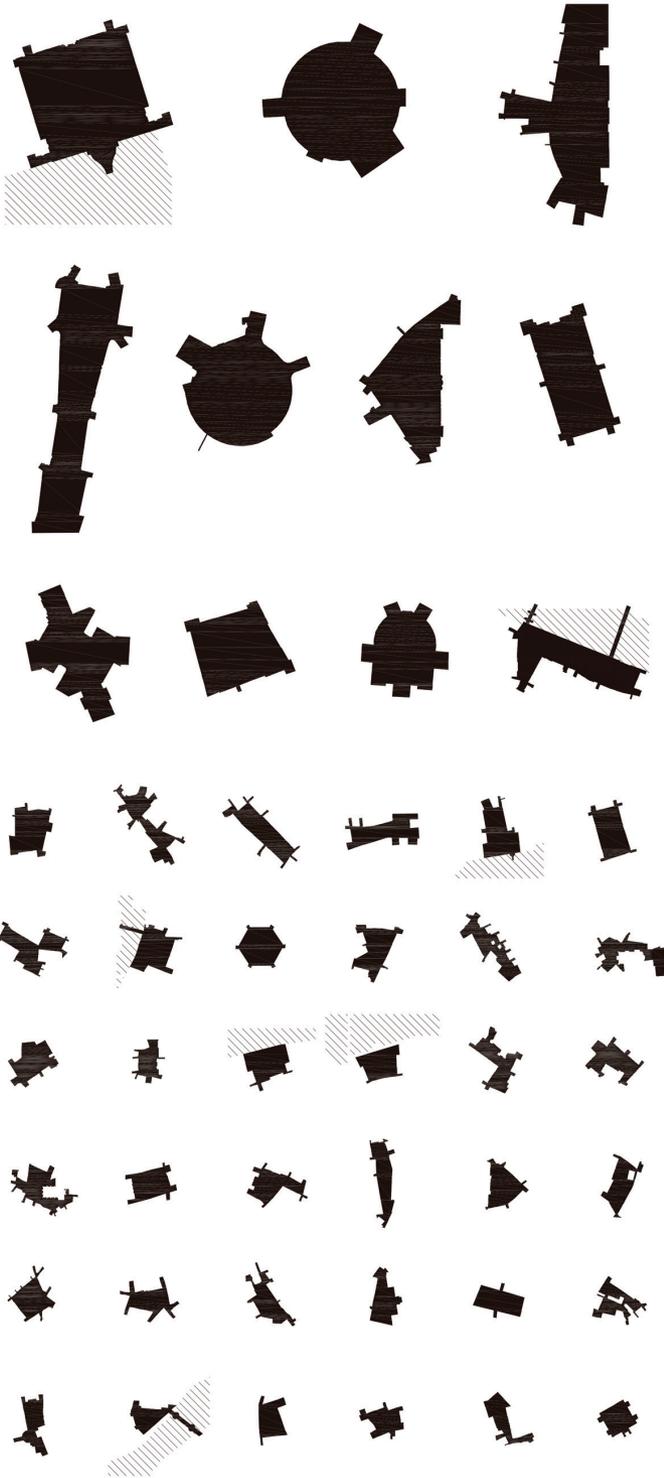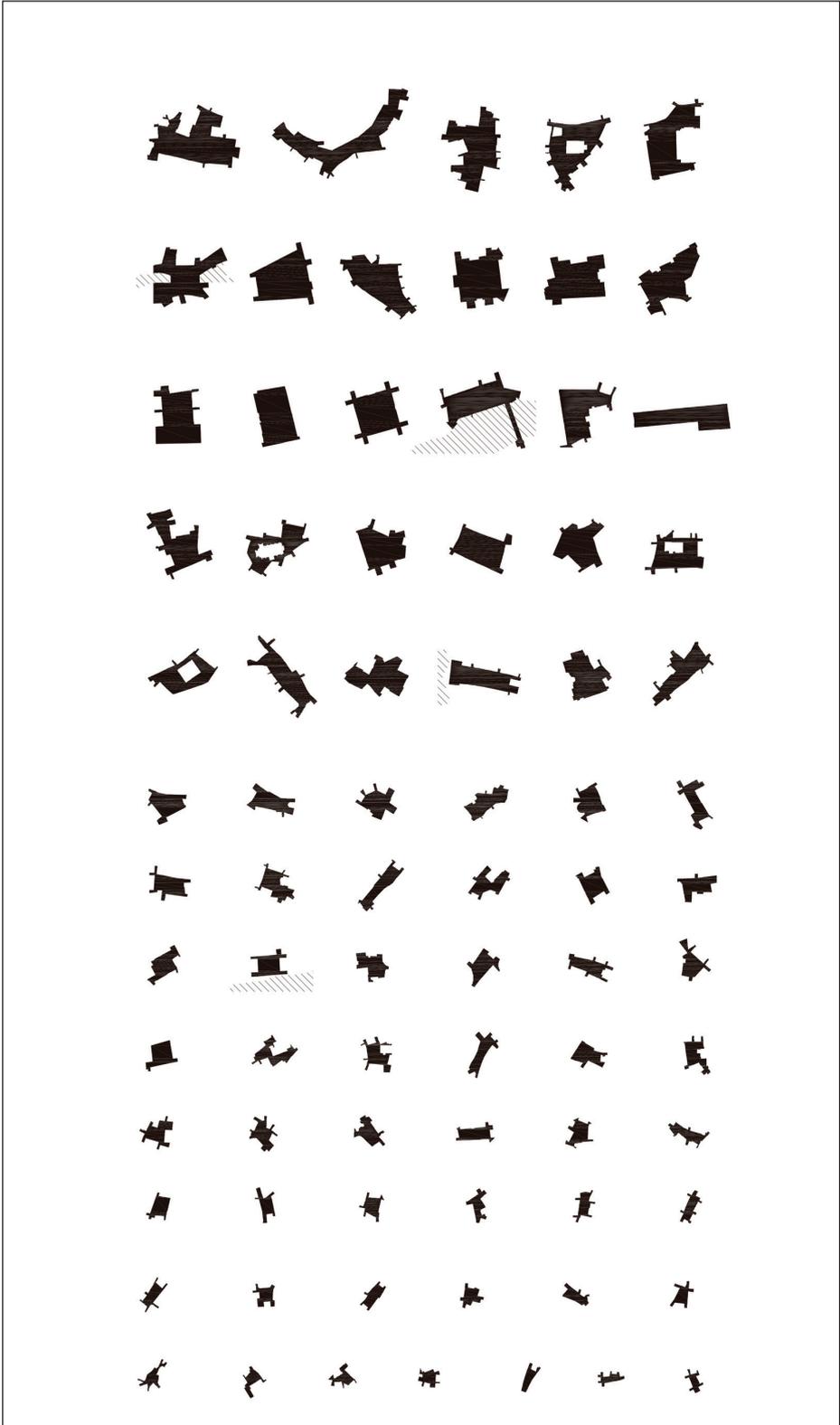
SAMPLE

SQUARE

ALFAMA

0 m   100 m

0 m   50 m

BAIXA

ALVALADE

(4a)

STREET

BLOCK

0 m   10 m

0 m   50 m
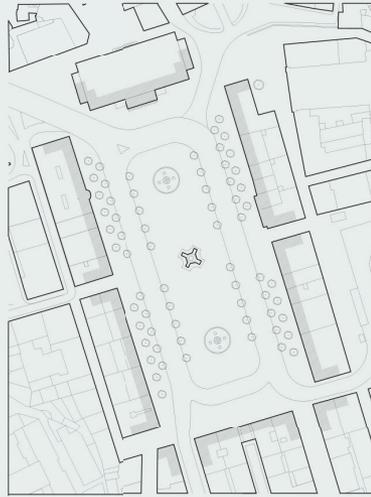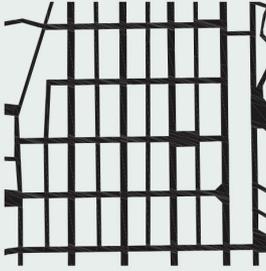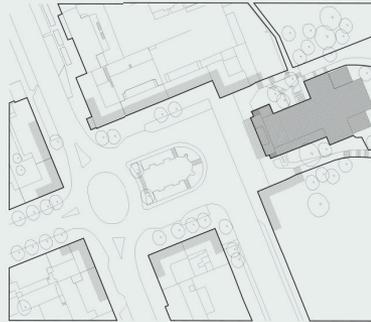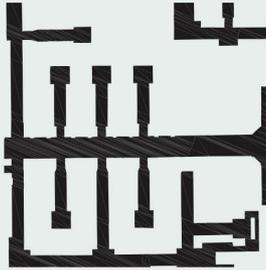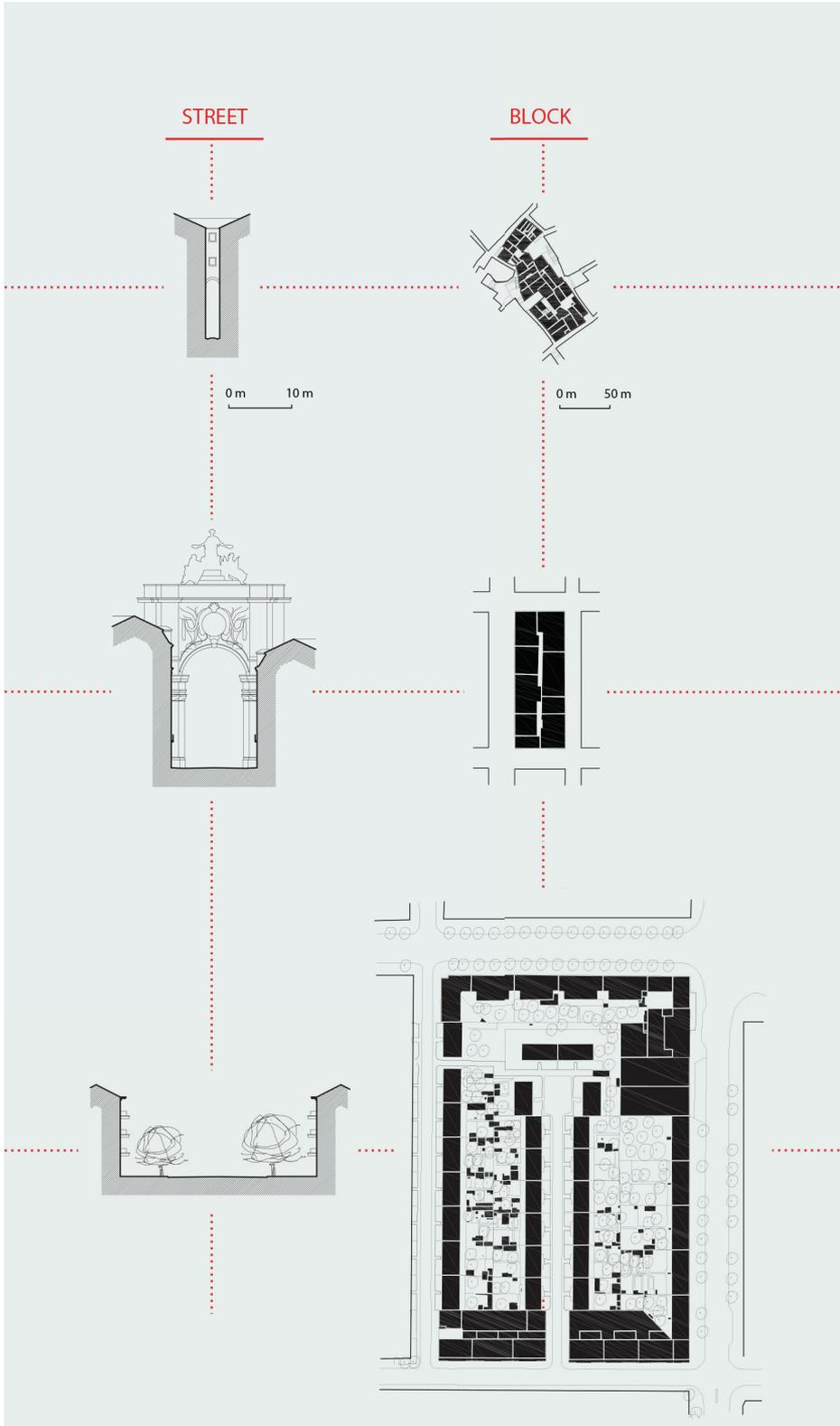
(4b)

Research base

As a method to approach the city that includes grasping both its interpretation and potential urban evolution, the research group FORMA URBIS LAB was launched during 2006 with the aim of constructing a Morphological Atlas that uses the Portuguese city as the focus of its study.

A project was organised based on the experiential account from other authors, namely, a special mention must be made to the pioneering work "Encyclopédie de l'Urbanisme" by Robert Auzelle and Ivan Jankovic edited during the 1950's, the more recent "Great Streets" by Allan B. Jacobs, and the "The Dutch Urban Block" by Susanne Komossa and Han Meyer.

The construction project of the Urban Form Atlas of the Portuguese City, distinguishes itself by approaching the urban fabric and its principal components through a transversal and integrated method, one which also facilitates the correlation of all of the existing components.

The project integrated previous researches that were developed by the laboratory, and hence it will consist in the selection, graphical restitution and both illustrative and written descriptions of the different exemplars of the built fabric within Portuguese cities and their respective individual urban elements of composition. This collection aims for the composition of a representative set of typological diversities, evolutionary state, sedimentary processes, dimensions, and urban uses.

In the construction of the distinct sections of the atlas by the FORMA URBIS LAB, various projects were developed: "A Rua em Portugal – Inventário Morfológico"[1] between December 2007 and March 2011; and the project "O Tecido Edificado da Cidade Portuguesa – Inventário Morfológico"[2] that was concluded in September 2014. Furthermore, there was also the integration of previous projects from the same team, namely: "A Praça em Portugal, Continente – Inventário de Espaço Público"[3] published in

[1] Financed by the Foundation for Science and Technology (PTDC/AUR/65532/2006).
[2] Financed by the Foundation for Science and Technology (PTDC/AUR-URB/111835/2009).
[3] Financed by the Direcção–Geral do Ordenamento do Território e Desenvolvimento Urbano

2007, and the project "A Praça em Portugal, Açores – Inventário de Espaço Público"[4], previously published in 2005.

The project of the Morphological Atlas of Portuguese Cities is organised in three sections: (1) the city; (2) the public city; and, (3) the private city. Respectively, and, through a standardised method of characterisation, are approached: the urban fabric and the urban layout; the public space of the city through mutually scrutinising both squares and streets; the private space of the city, that at an initial phase determines the basic units of the edified fabric, the urban block and its plot structure, and at a latter phase studies the building typologies (FIGURE 5).

The objective of the analysis, one which is based upon an encyclopaedic approach, implies that the approached examples will be treated through a systematic approach, and through a unique model. This shall enable a comparison amongst the various chosen cases, and their integrated components. Consequently, an approach such as this will enhance the cellular nature of the latter within the composition of the urban fabric.

In this sense, an identical and comparable graphic representation of the different elements is proposed, i.e., through the use of the same graphic representation codes and scales. This shall be catalysed from a conjunction of drawings, which are accompanied by photographs, interpretative drawings, and a synthetic characterisation text. These shall approach the constructed urban context in such a way that shall scrutinise its enclosed origin, morphology, and main uses. (FIGURE 6)

By conceiving and developing such a project, it is expected to construct a base of interpretative data that can potentially construct a fundamental tool for the research of the urban form. One that is moreover projected to also aid intervention projects within the contemporary city. In this context, the research, both the individual sections and wholesome approach, aims at accomplishing two predominant objectives.

The first consists in providing an educational and pedagogical instrument for the study and teaching of both architecture and urbanism, an instrument itself as essential as the cartography.

The second objective consists of producing an effective instrument that propagates the reflection and practice of

57

1:1000

1:1000

1:2000

SQUARE

STREET

SITE

URBAN FABRIC

URBAN LAYOUT

1:10 000

SINGULAR BUILDING

COMMON BUILDING

BLOCK

1:750

1:750

1:2000

PLOTS

(5)
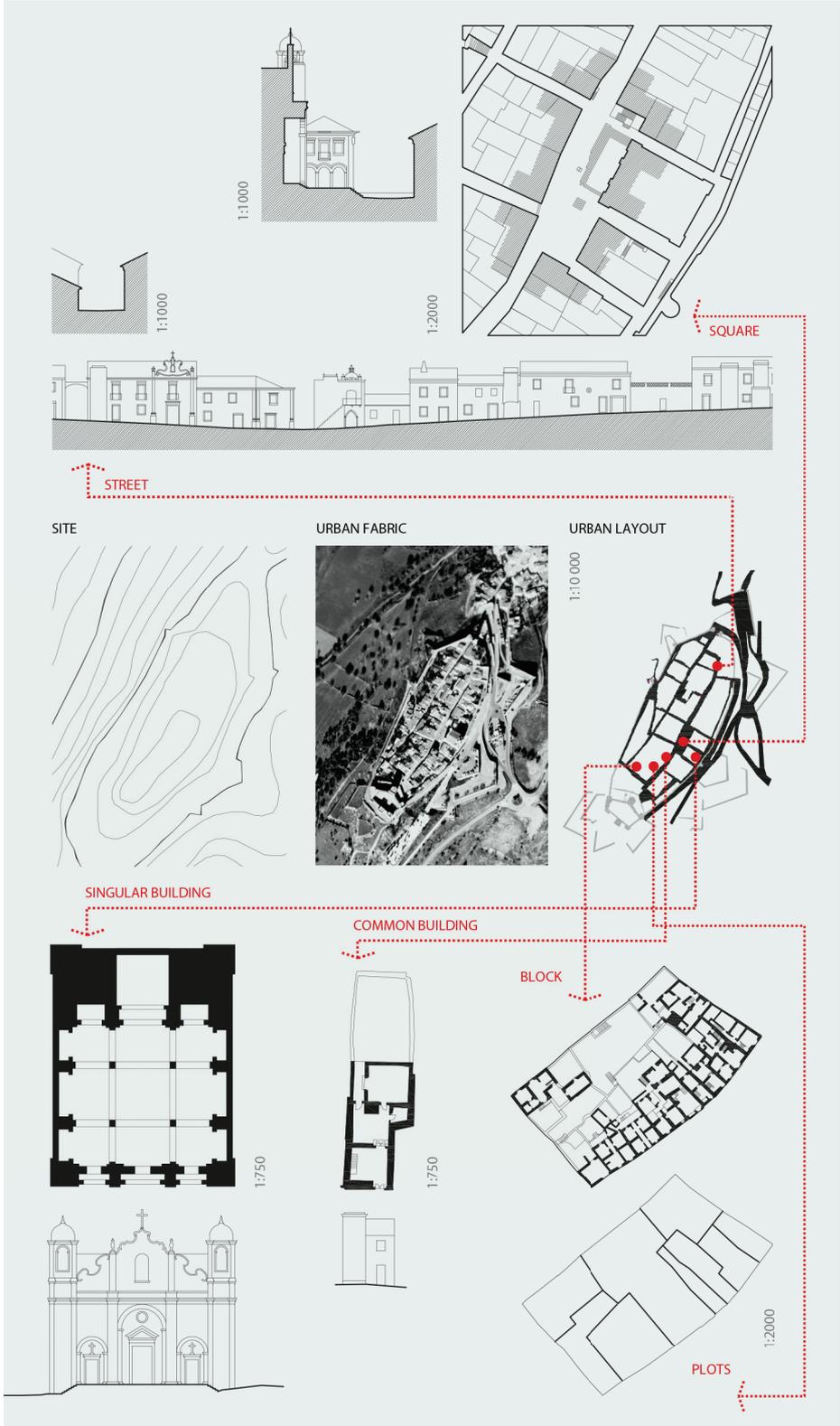
URBAN FABRIC

URBAN LAYOUT

TOPOGRAPHY

(6a)

(6b)
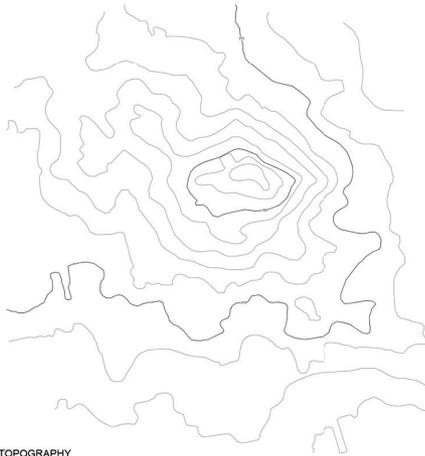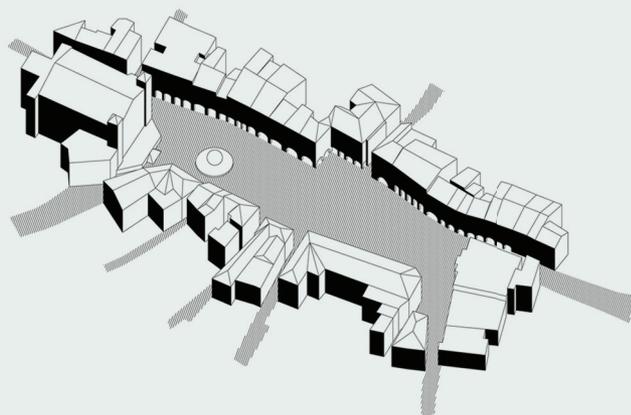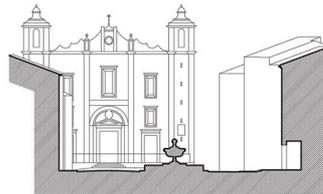
(6c)

urbanism. This aim is one that is not directed at merely considering operative planning models, but to provide a set of types produced by concrete and reputable examples. Through this tactic, such examples aid the assembly of a solid typological base, which in turn, shall nurture the contemporary design and construction of the city.

Individual Projects

The availability and dissemination of the atlas has enabled its use by all of the team's researchers, particularly for the members and collaborators of the FORMA URBIS LAB that initiated their own individual researches or with other research teams with similar thematic lines of research. From these, various diverse projects can here be mentioned: "Genesis and form of the Portuguese city. Morphology, typology and sedimentation", developed by Sérgio Fernandes; "The diversity of the street in the city of Lisbon. Morphology and morphogenesis" by Sérgio Proença; "Emergent Streets. Type-morphologies and structure on the Portuguese urban context" by João Leite; "The 'Rua Direita' (Straight Street). Composition element in the urban fabric of Portuguese origin" by Ana Amado; "The persistence of urban forms: reading the pre-existences in the construction of the Portuguese city" by Pedro Martins; "The Lisbon urban block: from shape to type" by Rui Justo; "Urban form, evolution vs. conservation. The transformation of the monumental fabric in Portugal" by José Miguel Silva; or, "The city as a cultural creation", by Carlos Dias Coelho.

These researches, which search to address diverse concerns, always depart from the urban object, as it presently exists, and utilising its selected elements and systems, subsequently deconstructed and graphically treated for the construction of the Atlas. Furthermore, such urban elements and systems are interrelated and scrutinised by the factor of time.

Methodologically, the absence of referential absolute values for the urban object leads to the tactic of comparative analysis to approach it. This approach may be illustrated from the two axis proposed by Ferdinand de Saussure, in other words, one axis refers to similarities and the other refers to successions. In the first, the axis of similarities, is undertaken a comparison between urban fabrics, systems or urban elements in similar or even in dissimilar contexts. This comparison is however permanently stationary, and undertaken during the same temporal period. The second axis, the axis of successions, presents the journey of the same urban element, departing from the present and then historically regressing in order to justify its configuration in the present; and

2100

2014

Axis of sucession
Time

Tokyo

Rome

Lisbon

Paris

New York

Axis of simultaneity
Space

Today

1911

1660
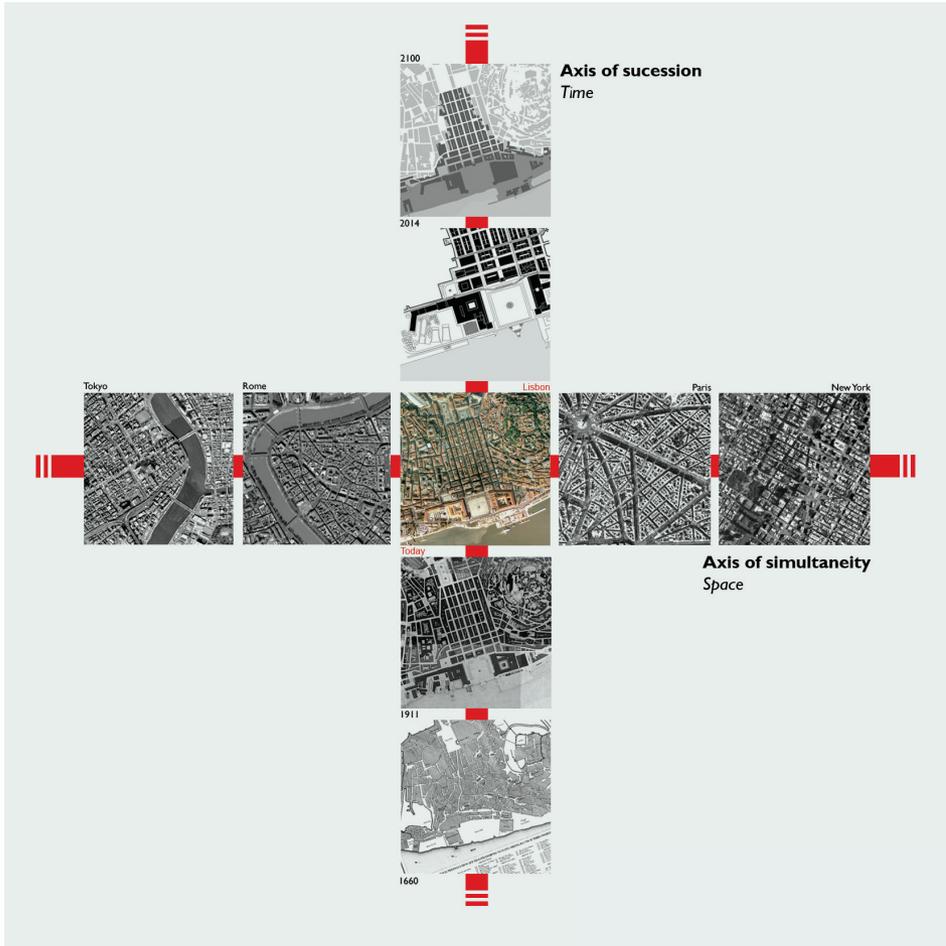
(7)

towards the future, undertaken within the scope of an architectural project. (FIGURE 7)

This methodical approach permits the reading, interpretation and comprehension of a complex reality. Furthermore it opens the support and ground for conceptions and solutions for projects that respect such reality and endeavour to contribute to its temporal development.

On the other hand, the analysis of the urban fabric can and should be undertaken at diverse scales, from the scale of spatial planning to that of the architectural dwelling. In this way, the segments and components are related to one another during their respective interpretation.

The interpretation
through decomposition
and graphical representation

To facilitate the understanding of the utilised methodology, and particularly of the role of drawing as a fundamental tool in comprehending the urban form, three examples were selected that distinguish themselves in their analytical scales and axis.

The first case concentrates upon shifting the axis of succession, and focuses on the city of Braga, located in the north of Portugal, based on the theoretical reconstitution of its main phases of evolution. Hence, starting from the present, Sérgio Fernandes established four key stages that correspond to specific periods of the evolution of the city and retroactively identified: (1) the "transformation" - between the xix century, and mid-xx century; (2) the "consolidation" - between xvi century, and mid xviii century; (3) the "ruin or retraction" - between the vi century, and xv century; and, (4) the "settlement" - between first century, and v century.

This temporal phasing can justify the profound alterations that occurred in each of the periods, and the fashion in which this takes place as a result of the reinterpretation of the previously existing elements. In order words, this inverted chronological development consequently explains the existing form of the contemporary city. (FIGURE 8)

The second case illustrates the strata decomposition of an urban element in a formation phase; i.e. a peri-urban road that is in a state of metamorphosis towards its transformation into a street. João Leite defined the object of study, and broke it down in order to further use the obtained strata in a comparative process. Such process both enabled the comparison with similar cases and the establishment of the evolution of the object itself.

The process permitted the characterization of an emerging phenomenon, to identify the changing moment in the nature of the object, and above all, predict the possible paths of its evolution, both its territorial role as, at a finer scale, the alteration of the building typologies themselves. (FIGURE 9)

In the third case, various elements are presented by the work of Xavier Monteys regarding the three major common types of habitation within Lisbon after the mid xviii century earthquake, namely: (i) the Baixa Pombalina habitation, which stabilised during the second half of the xviii century; (ii) the "light well" housing, typical of the end of the xix century, and early xx century; (iii) the "cod tail" housing building, characteristic of the mid xx century. Through a phenomenological approach, it was possible to identify stable elements in every one of these periods such as: (i) the façade facing rooms; (ii) the existence of an independent access compart-

(8ab)

(8cd)
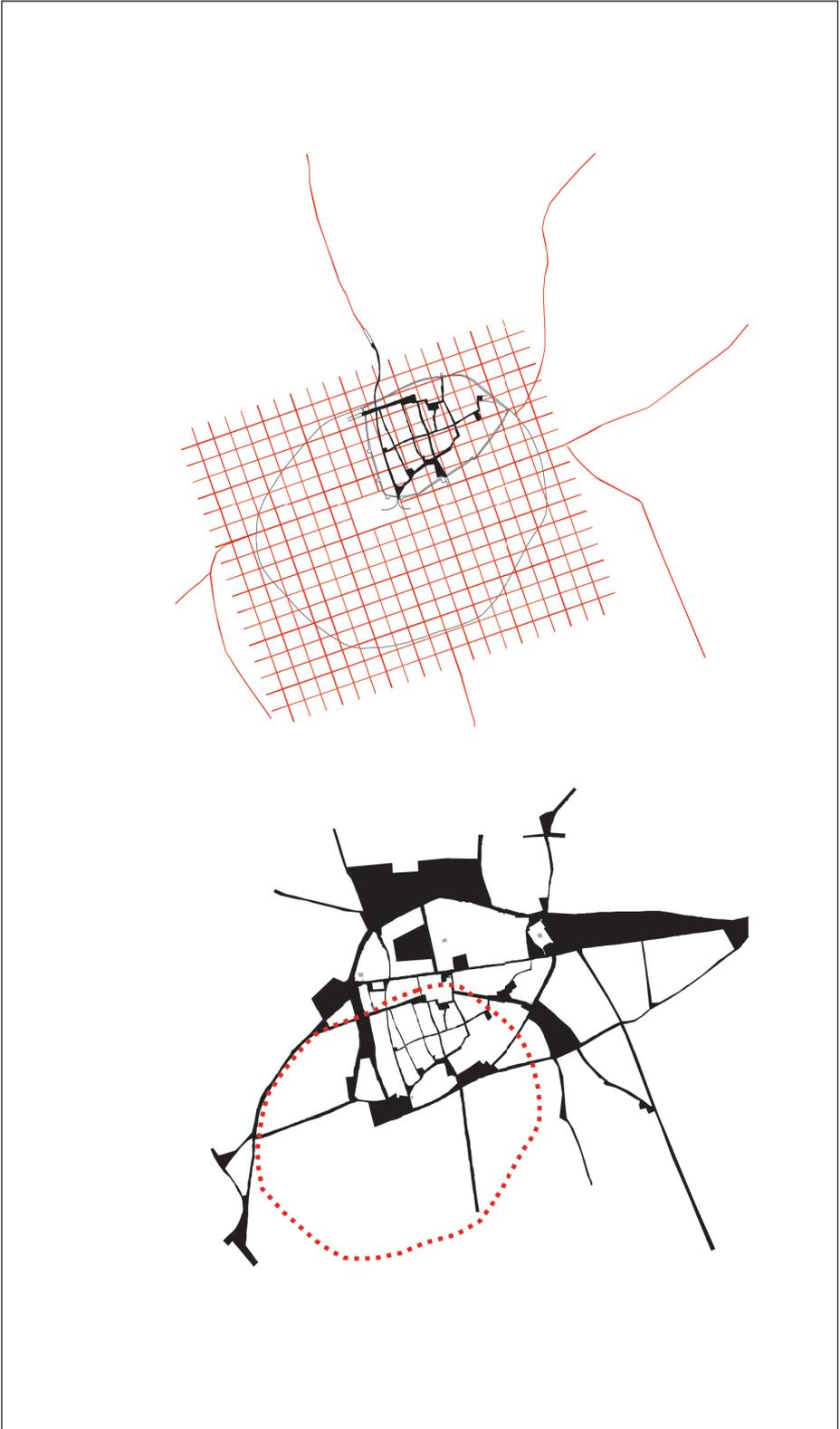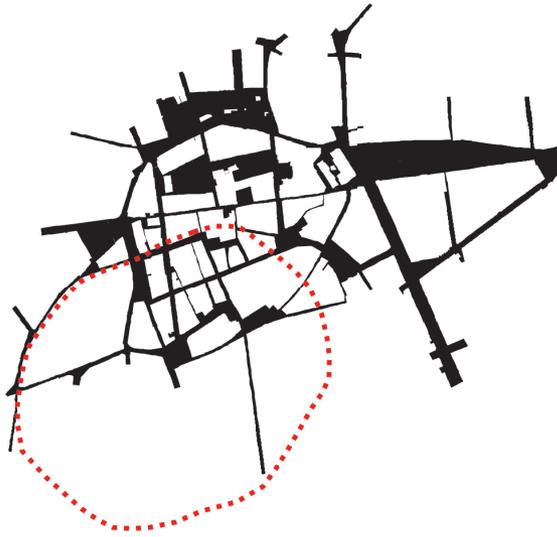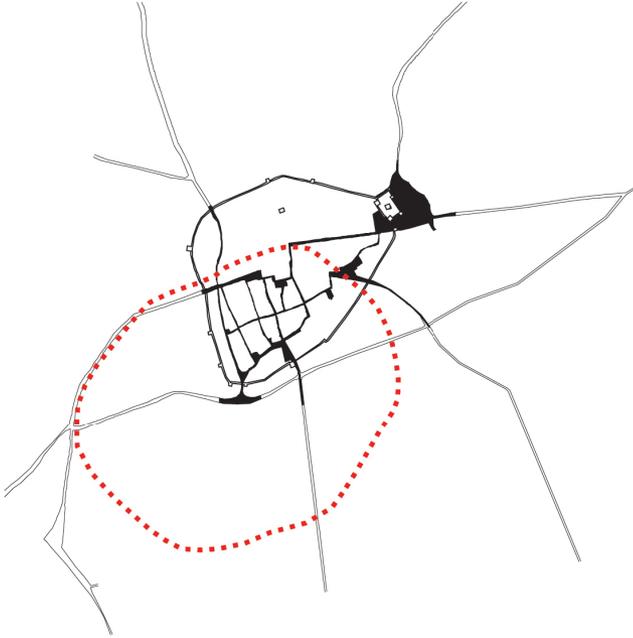
ment to the stairs; or (iii) the location of the kitchen. In addition, it was possible to recognise elements that constituted the typological evolution, and that characterise each of the periods (such as the corridors, the appearance of the dining room, and the relationship of the dwelling with the rear patio. (FIGURE 10)

The construction of models

Notwithstanding, all of the methodological procedures, that result in the project, lead to a contradiction. If the analysis and explanation of an existing urban object (or in any state of existence for that matter) refers to questions methodologically stabilized and procedurally recognizable, the project phase shall always imply a jump into a new ground, the ground of creativity and imagination.

If we return to the two axis that were proposed by Ferdinand de Saussure, and focus upon the object as it currently exists, the translocation in the similarity axis and in the temporal axis when looking into the past refer to a methodological approach which is characteristic of the Sciences. When considering the future of the temporal axis pertaining to an urban object, the intellectual process refers to that of creation and imagination. Yet, unquestionably, one must also must relativize or at least frame the act of creation on a long term of life span of a city. In this sense, the condition of a given urban fabric during a fragment of time is both the result of intentional reasoning and voluntary materialization and those which arise obligatorily as a result of involuntary events and of historical and geographical conditioning. Be it a cliff, an earthquake, a king, or a regulatory policy, all can have a significant influence upon the resultant form of the city. In addition, and even more pedantically, it could be the trivial day-to-day actions such as a mere construction of a shed intersecting a street, or an insignificant plot being paralysed due to a property dispute.

This statement only serves to reframe the role of the architect as the creator of the city, and not to omit it. Furthermore, it underpins that our role on the creation must be articulated with others, and it is the resultant mutual comprehension that fully enables the affluence of Man's built form. Therefore, when one is presented with questions regarding the future of our cities, there shall never be a concise answer but at least as many answers as the number of people that are questioned. A creative process is not independent of the concrete world in which it expresses itself; however, its richness lies in its ability to interpret itself. In this sense, we may advance an example of a structure of a concept for the intervention of a particular case, knowing that regardless of the location it will materialize (and be it through an entity or single handed) its richness shall be conferred by creativity.

Urban Fabric

N

0m   200m

Waterlines

Urban Layout

(9)

(10)
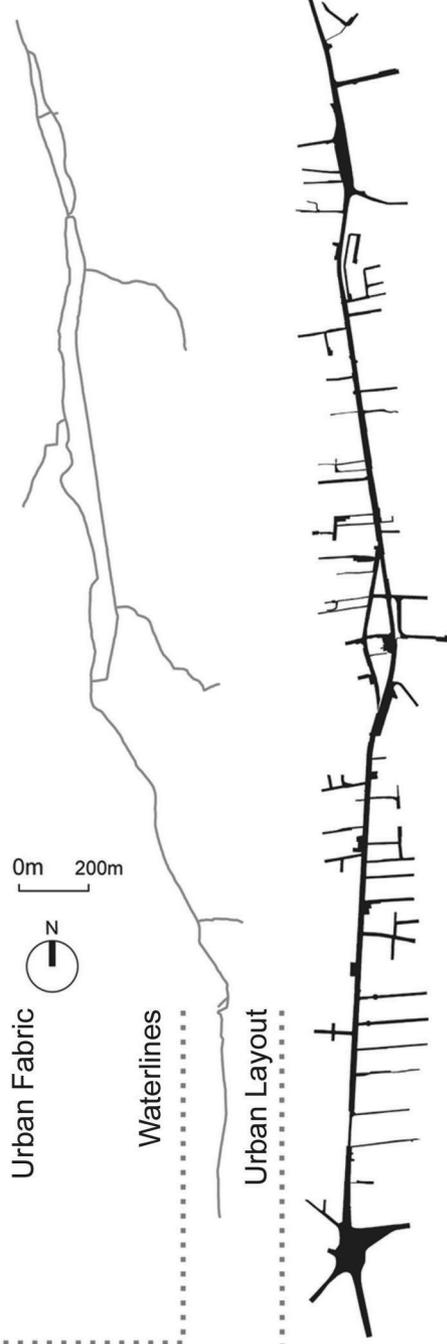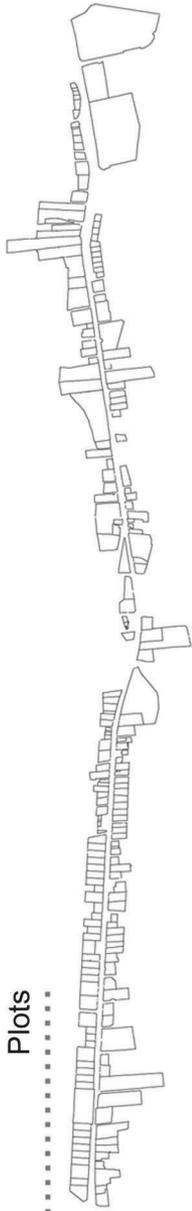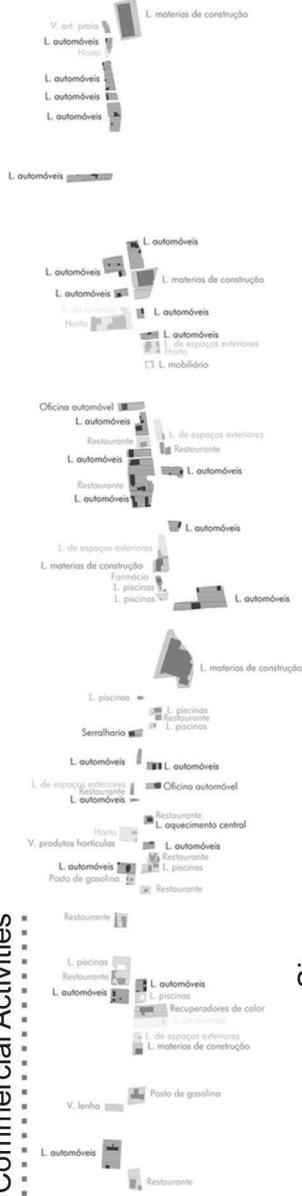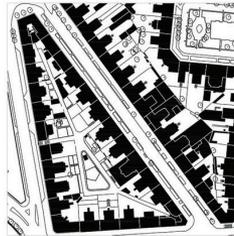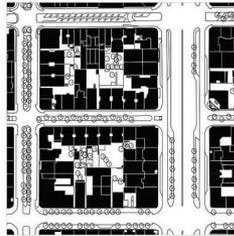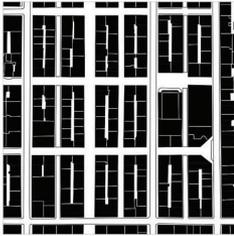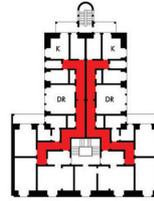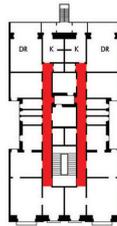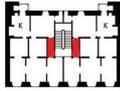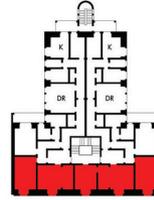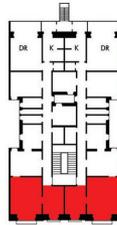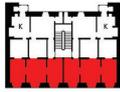
The example originated from a debate that took place during three years between the author and a responsible of the strategic planning of Lisbon's municipal council regarding the approach towards peripheral and suburban fabrics.

The response was a reaction to the propagated general consensus that exists in the two types of distinctive cities: (1) the consolidated city, defined by its centrality, and legibility; and, (ii) the peripheral city, defined by its disparity, unstructured and ineligible structure. In fact, from these two examples, two sides of the same coin, and urban organism, are revealed, thus one cannot resign to the idea that this dichotomy is indicative of an insurmountable realty.

If one is to comparatively analyse the fabrics of these two examples, and using the case of Lisbon as an example, one can verify that both are constituted by homogeneous fabrics; which moreover, are based around a simplified matrix that do not necessarily have to be of great sophistication. Nevertheless they are dissimilar, due to consolidated fabrics being articulated by structural urban elements, whereas in segregated peripheral areas, a search for the articulation with the centre of the city is revealed by large scale infrastructures. (FIGURE 11 AND 12)

Although the urban fabrics of suburban areas are defined by their segregation and peripheral nature, these have been the object of substantial effort. Such efforts have witnessed requalification investments and embodied the super-development of road infrastructure and urban equipment engrained within the respective urban fabrics. Such equipment includes the construction of schools and social establishments that have led to an overall improvement of the urban space, without substantially modifying the fragmented nature of these discussed areas.

As a result, the starting point was set by the analysis of how different homogeneous fabrics were articulated within consolidated areas, and the engrained role of urban elements that came to structure, and assume a hierarchical role. Such role presented itself as being potentially far more essential than the homogeneous fabrics themselves as they establish the location of buildings, spaces and urban activities of greater importance and prestige. Through the establishment of this concept, a planning model was elaborated for the development of peripheral fabrics, one that proposes the dislocation of effort and investments made in each of them into the interstitial spaces that separate homogenous zones. In this sense, these intersticial spaces would become the mediation spaces between homogenous areas with the role of interrelating them and changing their conjunctive composition. (FIGURE 13)

(11)

(12)

(13)
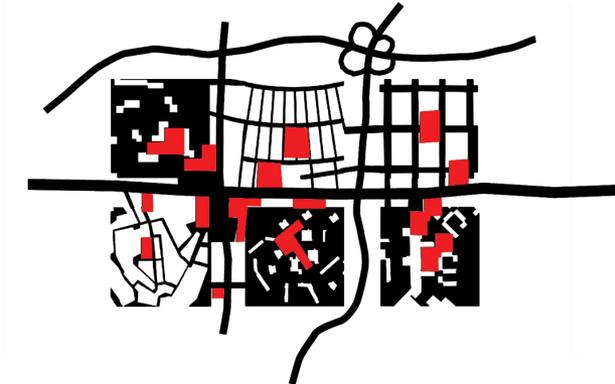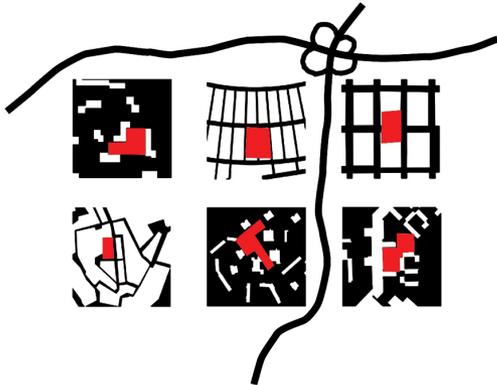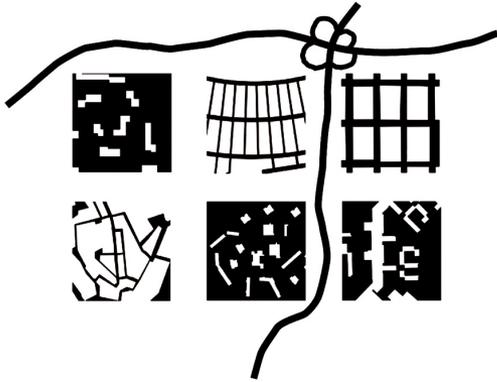
This model was aimed at supporting and stimulating a debate that would reverse the segregation tendency that, ironically, end up being reinforced by the undergoing requalification policies in these areas.

CONCLUSION

Approaching the city in its built form requires it to be considered an imperfect object. This notion should refer to the two facets of the word: (1) imperfect due to inefficient assembly; and, (2) imperfection due to being unfinished.

When one refers to the city as a form of art, one must consider it as a whole. In other words, as an object that appeals to our emotions in all aspects of the built form and encapsulating landscape. Everything that is aesthetically close to the exemplar has the ability to absorb, attenuate and integrate what is not seen as such.

Forgetting, if not fighting, this reality is the source of considerable mistakes within the urban production of the xx century. Nevertheless, a lot of the fighting that took place has not questioned (on the contrary to what is customarily believed) the city of the past; instead it questioned the city of the present, one that contains all of the information from the past and also its future, which somehow we now experience.

Bibliography

AA. VV, coord. Carlos Dias Coelho – Os Elementos Urbanos. Cadernos de Morfologia Urbana, Estudos da Cidade Portuguesa vol. 1, Lisboa: Argumentum, 2013.

AA. VV., coord. Carlos Dias Coelho, José Lamas – A Praça em Portugal - Continente, Inventário de Espaço Público, 3 volumes, Lisboa: Faculdade de Arquitectura da Universidade Técnica de Lisboa/Direcção Geral do Ordenamento do Território e Desenvolvimento Urbano, DGOTDU, 2007.

AA. VV., coord. Carlos Dias Coelho, José Lamas – A Praça em Portugal – Açores, Inventário do Espaço Público, Ponta Delgada: Faculdade de Arquitectura da Universidade Técnica de Lisboa/Direcção Regional de Ordenamento do Território e Recursos Hídricos, DROTRH, 2005.

AA. VV., ed. Susanne Komossa, Han Meyer, Max Risselada, Sabien Thomaes and Nynke Jutten – Atlas of the Dutch Urban Block, The Netherlands: THOTH publishers Bussum, 2005.

AMADO, Ana – «O reconhecimento da Rua Direita na paisagem urbana da actualidade apesar da ocultação da sua designação» in Seminário Internacional Património e Paisagem em Espaços Lusófonos e Hispânicos, 2012. Madrid. Património e Paisagem em espaços lusófonos e hispânicos . Rio de Janeiro: PROARQ-UFRJ-FAU, 2012, vol. 1, pp. 191–203.

AUZELLE, Robert; JANKOVIC, Ivan – Encyclopédie de l'urbanisme, Paris: Vincent Fréal et C. Editeurs, s/d.

BARREIROS PROENÇA, Sérgio – «O Papel das Ruas Naturais na Identidade de Lisboa. Morfologia Urbana e Topografia» in Actas do Seminário "A Rua de Todos", integrada na exposição "Rua é Nossa... de Todos Nós.", Lisboa, 2011

DIAS COELHO, Carlos; CARVALHO SANTOS, Thereza – «O capital genético das redes de espaços públicos: mutações e persistências» in Ordem, Desordem, Ordenamento - Urbanismo e Paisagem, org. Luiz Manoel Gazzaneo, Ana Albano Amora, Rio de Janeiro: UFRJ - FAU, 2009, pp. 284–303.

CASTEX, Jean, CELESTE Patrick, PANERAI, Philippe - Lecture d'une ville. Développement morphologique et théorie architecturale de la ville de Versailles, Paris: Éditions du Moniteur, 1980.

FERNANDES, Sérgio Padrão – «A Matriz de Assentamento no Traçado da Cidade Portuguesa. Identidade, Complexidade e Intemporalidade» in Actas do 2.º Seminário Internacional da AEAULP - Palcos da Arquitectura, Lisboa: FAUTL, 2012, pp. 312–324.

JACOBS, Allan B. – Great Streets, Cambridge: Massachussets Institute of Technology, 1993.

JUSTO, Rui – «Belém na relação com o rio. A construção de uma paisagem monumental», in Anais do Seminário Internacional Património e Paisagem em Espaços Lusófonos e Hispânicos, Madrid, Espanha, 2012.

LEITE, João – «Estrada Comercial. Conceito, Morfologia e Tipo», in riURB – Revista Ibero-americana – La Condición Urbana, Barcelona, Buenos Aires, Palma de Mallorca. n. 9, 2013, p 5–28.

MARTINS, Pedro – « A persistência das Formas Urbanas – Construção de uma hipótese para a forma urbana da cidade de Coimbra até à Idade Média.», in Actas do VI Seminário de Investigación en Urbanismo, Barcelona/Bagotá: Universitat Politécnica da Cataunya, Pontifícia Universidad Javeriana, 2014, pp. 92.

MONTEYS, Xavier – «Casas Lisboetas» in AA. VV, coord. Carlos Dias Coelho – Os Elementos Urbanos. Cadernos de Morfologia Urbana, Estudos da Cidade Portuguesa vol. 1, Lisboa: Argumentum, 2013, pp. 187–205.

MOUDON, Anne Vernez - Built for change: Neighborhood Architecture in San Francisco, London and Cambridge: The MIT Press, 1986.

MURATORI, Saverio - Studi per una operante storia urbana di Venezia, Roma : IPS , 1959.

SILVA, José Miguel – «A evolução do tecido urbano na relação com o monumento. O caso da Abadia de Santa Maria de Alcobaça», in actas do IV Seminario de Investigación em Urbanismo – Teoría e historia de la ciudad. Análisis y Ordenación del paisaje, Barcelona: DUOT/UPC, Vol. 2, 2011, pp. 273–282.

Figures

01. Francesco di Giorgio Martini, Trattati di archittetura ingegneria e arte militare.

02. Identification of the possible location of the Roman forum within the urban fabric of Évora (Pedro Martins, 2013).

03. Comparative Table of Portuguese urban squares.

04. Homogeneous urban fabrics and their compositional elements. The example of Lisbon.

05. Decomposition of the elements engrained within the urban fabric. The example of Mansaraz.

06. The physical characterisation within Giraldo square in Évora.

07. The method of comparison. The axis of sequential and simultaneity according to Ferdinand Saussure.

08. Evolution phases of the city of Braga. (Sérgio Padrão Fernandes, 2011)
 (a) *The settlement of Bracara Augusta, I–VII Century. Roman Foundation.*
 (b) *City abandonment, IX–XIV Century. Retraction*
 (c) *Urban densification and expansion, Century XVI–XVIII. Consolidation*
 (d) *Urban restructuring, Century XIX–XXI. Transformation*

09. Morphological disintegration of road/street 387 (João Silva Leite, 2013).

10. Common residential typologies in Lisbon: Baixa (XVIII Century); Avenidas Novas (1880/1930); and "Rabo de Bacalhau" (1930/1960)
 (a) *Segment of street frontages*
 (b) *Corridors*
 (c) *Urban Fabric*
 (d) *Photographs*

11. Central Lisbon area
 (a) *Urban fabric*
 (b) *Urban framework with the identified articulation infrastructure amongst the different morphological regions.*

12. Peripheral areas of Lisbon

13. Proposal of an evolutionary composition model of peripheral urban fabrics
 (a) *Urban composition model of the peripheral areas*
 (b) *Urban composition model for the qualification of peripheral areas*
 (c) *Alternative qualification model*

Mapping and Experimentation in Architectural Design

MARC SCHOONDERBEEK
Department of Architecture, Faculty of Architecture
Delft University of Technology

Introduction

How can architecture, or architectural research, nowadays operate in a field that Manfredo Tafuri had, at one point, described as a 'no man's land, the boundaries of which are forever shifting'?[1] How can one possibly, in an age of increased fragmentary orientation and specialization, define an architectural research program of which the intent and ambition is to break new theoretical ground and to introduce new techniques and methods of design intrinsically connected to this theoretical framework. Where Tafuri still had considerable difficulty with the 'hotchpotch' of architectural production[2] and the fragmentary state of the discipline in his era, any current attempt at an architectural discursive act(ion) has long accepted the un-orderly state of

[1]   Manfredo Tafuri, 'Main Lines of the Great Theoretical Debate over Architecture and Urban Planning, 1960-1977', in: *A+U*, no. 01, 1979, pp. 142-161. Quote from page 157.

[2]   Ibid., p. 143.

contemporary architectural design and research practices, even though attempts at an occasional 'rappèl a l'ordre' resurface in international or local debates.

Nowadays, it is clear that contemporary architectural research cannot be reduced to a singular trajectory of thought and analysis, just as the practice of architectural design is not founded on a singular theoretical structure, nor that spatial analysis is confined to one disciplinary form or that the understanding of an architectural object would be limited to one all-encompassing idea. It would seem that, in short, within the general contemporary 'hotchpotch' of approaches and positions it is apparent that any architectural research program nowadays only makes sense when one attempts, as any striving towards a 'research program' would indicate, to structure an implied 'discursive whole', based on the incorporation of the diversification of architectural knowledge, tools and methods.

Architecture
and the Problem of Discipline

The specific task Tafuri had set himself was to properly organize and dissect the historical material for its own sake. This historical material, in total fact actually the larger discursive tradition of architecture, was not to be purposely investigated for contemporary architectural design practices themselves, in other words not to try to make historical material operational, but to be able to dissect any architectural statement towards an understanding of its cultural activities and towards a clarification of its embedded meaning(s). The 'tendency' Tafuri had attempted to formulate[3] was, naturally, not an isolated case, but formed one of the more ambitious endeavors at the time. Other attempts to make sense of the debris caused by the ongoing societal, scientific and economic developments and upheavals of the 1960s and 1970s, combined with an emerging historical awareness, gave rise to a great variety of architectural and urban theories that attempted to, still, provide for an all-encompassing theory of architecture. During this period, however, the problematic nature

3   Most notably in Tafuri's *Architecture and Utopia; Design and Capitalist Development,* (Cambridge/ London: The MIT Press, 1976). Original: *Progetto e Utopia* (Bri: Guis. Laterza & Figli, 1973) (translated by Barbara Luigia La Penta).

of such endeavors was clearly visible, if only in hindsight. Though not consciously acknowledged, the positions in this period are characterized by their great emphasis on the limitation of scope, the fragmentation of the experience of the city, certain relativisms towards issues of 'truth', as well as an awareness of the claimed 'bankruptcy of the meta-narrations' in historiography.[4]

This period of intense reconsideration of the specific knowledge and tools of architecture was followed, during the 1980s, by the emergence of deconstruction or, more exponentially, the expanded discursive interest around the field of architecture[5]. The aftereffect of two decades of intense study of architecture's rich history, which established a clear core (and an assumed autonomy) of the architectural discipline, was the infection of the profession with other disciplines. Cross-, trans- and multi-disciplinary investigations allowed for an assessment of the outer edges of the architectural discipline, which not only clarified the position of the architectural discipline in the larger field of discursive practices, but also explored, and thus opened, the discourse to the shared territories of disciplinary action. Simultaneously, or perhaps even coming out of these explorations, is the emergence of 'research' as a separate and distinctive field of operation within architecture (next to design, theory, history and criticism).

Theory versus Research

Starting with Vitruvius's ten books[6] on architecture, the historical origin of 'architectural theory' is located in the great tradition of architectural treatise writing. Through the written and drawn

4   Jean-François Lyotard, *The Postmodern Condition: A Report on Knowledge* (Minneapolis: University of Minneapolis Press, 1984). Original: *La Condition postmoderne: rapport sur le savoir* (Les Editions de Minuit, 1979).

5   The clearest and extensive attempt at clarifying the origins of deconstruction in architecture being rooted in Derrida's philosophical œuvre has been made by Mark Wigley in his book *The Architecture of Deconstruction; Derrida's Haunt* (Cambridge/London: The MIT Press, 1993). See also: Andreas Papadakis, Catherine Cooke and Andrew Benjamin (eds.), *Deconstruction, Omnibus Volume* (London: Academy Editions, 1989).

6   Marcus Vitruvius, *The Ten Books of Architecture* (New York: Dover Publications, 1960).

accounts of a treatise, architectural and building practices are extended to include at least two distinctive activities, namely the prescriptive gathering and systemized ordering of knowledge; and the possibility of debate and discussion of the inherent logic and meaning of these practices. Architectural theory, at least until the 18th century, maintained and cultivated this prescriptive character by insisting on its basic objective to provide for a systematic body of knowledge, combined with a set of instructions that 'ground' architectural production. During the Enlightenment the architectural treatises gained more precision through the attempt to provide for the scientific basis of architecture based on principles of reason.[7] Still, in all these cases, theory was considered to be the proper means to develop such a consistent way of thinking and working in architecture. In the course of time, however, theory started to increasingly emphasize its reflective role, i.e. the second category mentioned above, and transformed into architectural criticism.

In addition, architectural discourse has become increasingly aware of the exponential growth of its possible tasks. This growing of tasks has obvious been a result of the industrial revolution and the emergence of capitalism, and as a result has meant that the original set of instructions defined in the history of architectural theory, which addressed a rather limited amount of possible architectural projects, no longer dealt with the entire range of (future) possible architectural action and, therefore, production. Theory had become rather ill equipped to still provide for a systematic body of knowledge in a period during which a substantial 'division of labor' occurred. Furthermore, since the tasks of the architect were broadened, and even made explicitly open and flexible to allow for adjustments based on the logic of the market-economy, theory could no longer properly anticipate the architect's production a priori, but had rather to approximate these. As a result, and especially in recent decades, research has become an alternative to theory in providing another, distinct, rather specific and almost unrelated, set of knowledge and instruments resulting in architectural production.

7   Jean Nicolas Louis Durand, 'Précis de leçons d'architecture données à l'École Royale Polytechnique (1802)' in: Harry Francis Mallgrave (ed.), *Architectural Theory: Volume I - An Anthology from Vitruvius to 1870* (New Jersey: Wiley-Blackwell, 2005).

What is currently high on the agenda in this contemporary engagement with research is the elaboration of its role in relation to the architectural design project. A point of obvious critique when assessing these efforts is that the specific prescriptive role that was played out in architectural theory previously, is not very specifically elaborated upon in contemporary architectural research. This omission, or absence of clarification, about the role research has in a design process is in need of being addressed. Nowadays, research is specifically used to describe the contextual preconditions of an architectural project. It sketches out the social, political and economical state of affairs related to a specific location, it addresses the specific types of knowledge coming out of these investigations, but it hardly ever addresses the way this knowledge is instrumentalized, conceptualized or made operational within an architectural design process. In other words, how forms of spatial analysis influence, in a direct or indirect way, the process of architectural design.

Architecture
and the Problem of the Contemporary City

The so-called 'problem' of the contemporary city falls somewhat in line with the changed role of the architect in modernized times. Not only the activities of the architect have expanded and diversified, also his field of operation has diversified and multiplied. The modern metropolis has always evoked an impressive array of artistic and architectural responses, based mostly on the profound experiences of condensed space. In the last couple of decades, spatial experiences evoked by the contemporary city have been described using theories taken from the exact sciences (for instance chaos or catastrophe theory), and by implementing an equivalent terminology (using words such as complexity, network, multiplicity, topology and instability). This terminology marks the transition that has taken place in reflections on the urban condition, namely the shift from descriptions of the city as an undiversified space of densification, to descriptions that emphasize the city as a field of intensities and differentiation.

This revised interest in the city is precursed by the explorations of the American city initiated in the early 1970s.

Boyarski, Banham as well as Venturi/Scott Brown/Izenour[8] were the first to acknowledge and bring forward 'the contemporary city' as a concrete and 'real' subject of architectural investigation. Chicago, Los Angeles and Las Vegas are the subsequent first three examples where the characteristics and specificities of 'a' particular city were considered indicative towards a larger discursive understanding in architecture. The city as factual and real entity could potentially have certain properties that one could distill and project forward as basic principles of a contemporary architectural focus. Koolhaas had understood this probably the clearest, not only because of the retro-active manifesto of Manhattan he compiled within years after the three 'city' manifesto's, but especially considering that his investigations of New York have remained the blue-print for constructing similar theoretical manifestoes with the fascinations for Atlanta, Lagos, and the Chinese/Asian generic city, which have turned this journalistic act into a specific methodology.[9]

Surely, one of the contradictions that came out of this period is the fact that the city as a whole is 'processed' towards a thematic proclamation, ignoring any kind of differentiation embedded within those cities themselves. The contradiction, here, is located in the fact that the end of the meta-narrations of post-modernity should have resulted in the conclusion of the impossibility of such endeavor. On the contrary though, Koolhaas's emblematic role in sublimating the general tendencies of New York in the 20th century or Atlanta in the 21st, meant a simplification beyond reason when describing the city as real model, though one must confess that these simplifications have had their importance when specifying and determining certain developments that were indicative and thus relevant for architectural discourse as a whole. On the other

8   Alvin Boyarsky, 'Chicago à la carte: The City as Energy System, in: AD, December 1970; Reyner Banham, *Los Angeles; The Architecture of Four Ecologies* (Berkeley/Los Angeles/London: University of California Press, 2001 (1971)); Robert Venturi, Denise Scott Brown and Steven Izenour, Learning from *Las Vegas: The forgotten Symbolism of Architectural Form* (Cambridge/London: The MIT Press, 1996 (1972)).

9   Rem Koolhaas, *Delirious New York; A Retroactive Manifesto for Manhattan* (Rotterdam: 010 Publishers, 1994 (1978)).

side of the spectrum, one would find for instance the work of the Situationist International. Here, one could be perplexed by the fragmentary nature of their understanding of the city and the simple fact that they did not even attempt to consider the city as a consistent whole. Rather, the fragmentary nature is not only being made explicit but is forced upon the city. The GUIDE PSYCHOGÉOGRAPHIQUE DE PARIS and THE NAKED CITY maps[10] are such forceful Situationist attempts that not only dissect the city in smaller bits and pieces, but transfigure it by forcefully detaching the parts that are seemingly connected in order to arrive at an understanding of the city that offers a set of instructions of how to operate, maneuver and/or live in it.

Research versus Design

The general tendencies sketched thus far, namely the discursive developments towards increasingly multi-disciplinary perspectives on architectural issues and activities; the need for overcoming the differences between spatial analysis (i.e. research) and architectural design; and the inexhaustible and in fact ever-expanding relationship of architecture with the city, converge in the 'Border Conditions & Territories' (BC&T) research program, currently operating in Delft. The program finds a common ground in the understanding that (1) the territorial and urban contexts are the primary forces that both influence and determine to a large extent contemporary architectural production and that (2) the underlying philosophical, cultural, political and aesthetic value systems both influence and determine to a large extent the meaning/significance of architectural production. The BC&T research aims to both chart and relate these fields in order to establish the rules for and the reasons behind the complex spatial conditions, mechanisms and systems within contemporary cities and territories. Especially the specific, at times emergent, spatial conditions found in contemporary cities and territories are considered to be a rich field in need of exploration and ultimately comprehension. A certain relationship is presupposed between architectural construct and the 'grounding' of these constructs,

10   Published in 1956 and 1957, respectively. 'The Naked City' was first published in Asgers Jorn's *Pour la forme; ébouche d'une méthodologie des arts* (Paris: Internationale situationniste, 1957).

both in terms of situational context and theoretical framework(s). The attempt to clarify and relate the act of architectural design to the contextual influences on that act originates from this presupposition.

The need to address the expanding range of architectural production as well as the inherent complexities of the urban fields in which architecture operates, focuses the attention of contemporary research in architecture on the changing ways architectural production is conceived and perceived. The consequences of this changed perspective are rather extreme, as a radical reconsideration is required with respect to the employed techniques of design and spatial analysis, to the additional and related ways of understanding, interpreting, conceiving and representing architectural construct as well as to the theories with which the architectural object is understood (i.e. spatial models). In this discursive constellation, the sets of relationships that can be constructed between these three modalities are the primary points of attention. The diversity in modes of expression, which Tafuri considered problematic, turns into an appreciation of diversity. The heterogeneity that fundamentally lies at the basis of this intent includes the multiplicity of ideas that are not limited to the architectural discipline only, but might, or even should, be related to other discursive debates. The 'border condition' of the BC&T research program itself implies a clarification of the very limits of the discipline, making this research speculative and ambiguous. Within this framework, a particular kind of decentering or disorientation is inevitable, if one were intending to change the orientation of the architectural discipline at least.

The investigative structure explained above opens an intriguing perspective on the relationship between research and design. When considering the contemporary attempts to relate design to research, as the term 'research by design' would indicate, three different categories can be distinguished that describe the relationship between architectural research and architectural design: (1) to consider design as a specific form of research, thus considering the act of design in itself as an investigative act; (2) to consider design as object of research, by concentrating on design as methodological process, thus describing design as a reasonably controlled procedural act; or (3) to clarify how research might potentially inform design, thus directly relating spatial investigation to the project act of design. Following the argument, it should be clear that the BC&T research program is focusing primarily on the third category, without simultaneously dismissing the necessity to critically assess the overall relationship between research and design in architecture. In both cases, tools of spatial analysis, whether operative or reflexive, are intrinsically related to

architectural design. The methods used to analyze a context through spatial categories (be it cartographic, drawn, textual, digital, or otherwise) are related to the forms the architectural design act produces. In each case, the undeniable relevance of a plurality of investigative and design approaches, mentioned before, is thus incorporated into a research framework that focuses on the relationship between the acts of research and design (hence the term 'design by research' that opened this argument).

Mapping
(as an Index of Past and Future Possibilities)

In the attempt to link spatial analysis to architectural design, mapping is considered to be one of the more, if not most, promising tools. This potential of mapping, however, has hardly been acknowledged by mapping scholars. Cosgrove, for instance, a scholar who has inexhaustibly dwelled on the importance of mapping in a wide variety of discourses, considered acts of mapping merely as 'acts of visualizing, conceptualizing, recording, representing and creating spaces graphically',[11] while James Corner understood mapping as something that precedes the map, just as 'order is the outcome of the act of ordering'.[12] Nevertheless, when one glances through the historical and theoretical material focusing on maps and mapping in architectural discourse, one can discern a quite clear conclusive summary of the aspects relevant for the practices of map production in architecture: issues of scale, frame, selection (observation) and coding (notation) are geared towards the projection of three-dimensional space onto a two-dimensional surface or three-dimensional object. Relevant references to geometry, geography, topography, topology, and chorography ('place'-'writing') all play a role in this act.

The profound and rich and history of the discipline of cartography offers numerous examples of the art and science of map-making, as well as of the cultural and political ideologies that constitute their hidden agendas. Within that tradition, however, the difference between a 'map' and a 'mapping' has not often been

11   Denis Cosgrove, 'Introduction: Mapping Meaning', in: Denis Cosgrove (ed.), *Mappings* (London: Reaktion Books, 1999), p.1.

12   James Corner, 'The Agency of Mapping: Speculation, Critique and Invention', in: Cosgrove, *Mappings*, ibid., p. 229.

made explicitly clear. Mapping can be seen as the act of making or producing a map, i.e. part of the active tense of a verb. A mapping, however, is also possible as noun, namely the result of the making of a map. 'Mapping' can refer to the activated result of the making of a map, yet the Oxford dictionary (OED) also states that mapping, as noun, is used in MATHEMATICS & LINGUISTICS, and means 'an operation that associates each element of a given set (the domain) with one or more elements of a second set (the range)'. The relevance of mapping for architecture is in first instance located in the fact that mapping is a highly significant technique to explore and investigate the multiplicity of contemporary spatial conditions. A mapping is a representation of a social construct within a spatial frame and offers a means to navigate the space it represents.

A physical object or spatial phenomena is always embedded, and therefore constructed, within a particular social and political field. Meanings emerge from mappings via engaged acts of reading, mining possible multiplicities and vitalities out of the field of represented relations. What precedes the map, to be precise, is a selection process vis-à-vis the complexity of the world in which a decision is made as to what will be represented and what not. The fundamental difference between a map and a mapping is that the map offers a continuous surface or field description, while a mapping constructs a place-time discontinuity in the description and understanding of a spatial condition. This place-time-discontinuity of a mapping constitutes a distortion that obscures the regularities of Cartesian space and disrupts the chronological sequences of time, making mapping the discontinuous unfolding of 'a place' and 'a duration'. Furthermore, since discontinuity introduces a disfiguring of a place-order and a time-sequence and since a map implies a systematic way of measuring space, discontinuity means an adjustment in the way measurement is employed in map encoding. As every mapping simultaneously offers registrations of reality-as-found and indications of possible future interventions, the potential of mapping as a 'design via research' strategy needs to be acknowledged and specified.

Methods of mapping have been employed to make immanent spatial conditions 'accessible' for architectural construct on a few of occasions in architectural history. In these instances, special attention is given to the development of specific cartographic techniques enabling the registration of architectural form and/or the interpretation of urban spatial processes. In these cases, mapping is considered exceptionally relevant to this end, for the map becomes in many ways a nearly tangible place: a territory that is measured, circumscribed and demarcated. Nevertheless, even though mapping has been discussed at length in the past two decades, conspicuously absent in these discussions is the

relationship that mapping might actually have with architectural design, not only as a supporting tool, but rather as an integral part of the design process. There are numerous examples of urban analyses that have been part of, or incorporated in, the design process, but the findings of these urban investigations hardly constitute guiding design principles for an architectural intervention. Almost all examples in architectural discourse emphasize the urban context of architecture either via the collection of information (mapping as data visualization) or through an analysis of its formal principles (figure-ground maps or urban plan maps), but what remains absent is both a theory and a design strategy that connects these two.

A Design Theory

How, then, to develop the foundations for such a theory, out of which principles or guidelines for architectural design can be developed? How can cartographic means enable architects to chart characteristics of space and how can, as a consequence, mapping potentially inform architectural construct? Three basic principles are to be specified, first, when theorizing the way mapping informs architectural construct. To start with, the employment of mapping in architectural design means an activation of the map towards architectural construct and this activation of spatial analysis is both projective and performative. The activation that is being set in motion through mapping can be distinguished as the instrumentalization, the operationalization or the conceptualization of the map.

To 'instrumentalize', when referring to the first form of map activation, means: 'to render instrumental (to direct, organize, adapt)' or 'to transcribe for instrumental execution'. To use mapping for 'instrumental execution' is, in other words, a form of activation whereby 'transcription' is the means with which the map is put to use. The architectural instrumentalization of the map works via transcription, which is, in first instance, the specific notation or coding system within the mapping, intended to depict a specific understanding of a specific part of 'the human world'. Apart from this transcriptive act (namely from observation via interpretation to notation), an additional transcription takes place when the notation system developed in and for the mapping is subsequently 'transcribed' into a formal language (or simply 'form'). Bernard Tschumi's MANHATTAN TRANSCRIPTS presents one of the more important attempts at developing this kind of mapping

technique.[13] The TRANSCRIPTS address a radical shift in the architectural understanding of the nature of the city: no longer interested in unity, they accept a certain fragmentation and incompleteness in the contemplation of the city and introduce the moment of time in the reading of the city. Instead of referring to the past material and materiality of architecture, namely as neutral, objective, indifferent objects, the TRANSCRIPTS deliberately aim at architectural form being biased, subjective and inviting for a participatory engagement with that material. Representation is no longer one-on-one, but introduces an indirect relationship between 'image' and 'line'. The intrumentalization of the map works towards the distinctive architectural disciplinary act of production, namely towards architectural form via the development of a specific systems of notations.

The operationalization of the map, the second form of map activation theorized, works towards the distinctive architectural disciplinary act of producing a projective idea via the development of a specific measuring of differences. Any architectural design process initially has an open-ended question, which, to a certain extent, guarantees the incorporation of the state of uncertainty regarding the object under study and the process of investigation itself. It requires a strategy that is as rigorously open as possible, open to the possibilities of becoming, of imagination, of assigning meaning, of experience. Such an open-ended design strategy constructs knowledge through a 'bottom-up' process, rather than implementing knowledge in a 'top-down' manner. The activation of the map thus becomes an activation that can no longer be a search for a point of origin or an original meaning. The activation of the map that comes out of the Daniel Libeskind's BETWEEN THE LINES, as example, is a form of map activation that introduces difference through measure. Furthermore, this introducing of difference initiates an operationalization of the map's content towards a conceptual idea. In BETWEEN THE LINES, which would later become the Jewish Museum (in Berlin), differentiation and discontinuity are addressed by absence, void and silence in more than the one way that literally voided the Museum's structure.[14]

13 Bernard Tschumi, *The Manhattan Transcripts* (London: Academy Editions, 1994).

14 See, for instance: Daniel Libeskind, *Countersign* (London: Academy Editions (Architectural Monographs No 16), 1991)

The bringing together in the map can precede design, precisely because of this bringing together of 'substance'. The absent is present as a potentiality and/or a possibility, not as a literal absence.

The conceptualization of the map, the third form of map activation to be discussed in this context, enables the production of architectural theory and this is achieved through the development of a specific system of ordering implemented in the mapping. This system of ordering has similarities with the architectural tradition of constructing urban maps that depict the urban condition in its totality, but in contrast to mapping, these urban maps not only frame and order the city, but also fix the architectural objects as distinct singularities within a static field of differences. One of the intrinsic characteristics of mappings is that they create a reality that may lie beyond the realm of physical and material possibility. The recent developments in contemporary mapping underlines the tendency to integrate ephemeral characteristic of space with more tangible (or physical) aspects incorporated in the depiction of urban conditions. The measurement of spatial objects, forces and fields occurs via a means of representation that traces, maps and positions these spatial phenomena and constitutes the very basis of forming, gathering and constructing knowledge. Architecture is gathering, the bringing together of differences within one framework and, within this constellation, mappings are artistic fabrications that can potentially become performative tools for architectural production since they activate the projected complexities of the spatial features of an urban or territorial condition by offering an implemented ordering that is projected into the mapping. At that very moment, in other words, architecture becomes performative since it (spatially) orders plurality.

Research by Design, a paradigm shift?

Johan Verbeke
KU Leuven, Faculty of Architecture Sint-Lucas, Brussels-Ghent, Belgium
Aarhus School of Architecture, Aarhus, Denmark

In this paper we will argue that architectural research is becoming more and more important, not only in academia but also in architectural practice. Moreover, a shift is taking place from using and absorbing research methods from other disciplines towards building on the own specific strength of the discipline of architecture, i.e. using design and creative practice as a method to generate knowledge and disclose unknown aspects of reality. In doing so, this paper tries to place the Delft ARENA meeting Architectural Research Network Meeting (November 2013) in perspective.

Introduction

Although architecture is as old as humanity, it became a discipline in higher education more recently. Where the old universities have been founded in the Middle Ages, schools of architecture have been founded in the 19th century (mostly in the Beaux-Arts tradition as e.g. the Sint-Lucas School of Architecture in Ghent) or much later in the 1950s and 1960s as part of technical universities or engineering faculties. Hence, the discipline is still in its infancy compared to other disciplines, especially when it comes to research. The endeavors in architectural research within the schools of architecture only recently obtained high priority. Although some schools have a longer tradition in PhD education, the production of PhDs in architecture mainly started getting attention in the 1990s.

Academic, discipline-based research has been regarded as only mildly relevant to professional practice, has been viewed with great skepticism by practitioners, and has played a very limited role in professional practice. (Dunin-Woyseth and Nilsson, 2014) Moreover education in most schools of architecture has been mainly provided by practitioners teaching in the design studios. Therefore research has never been a priority up till recently. In fact, it is only in 2012 that EAAE (European Association for Architectural Education) established its research charter[1]. The charter states 'Any kind of inquiry in which design is the substantial constituent of the research process is referred to as research by design.' This is further elaborated in THIS IS RESEARCH BY DESIGN (Verbeke, 2013).

The organizers of the Delft ARENA 2013 meeting posed that 'after 10 years of exploring the possibilities and ways to integrate Research-by-Design into Architecture Design Studio Teaching and PhD Theses in Architecture, Landscape Architecture and Urbanism at various universities in Europe and around the world, the time has come to investigate these matured/maturing research approaches in relation to existing paradigms of architectural research & design'[2].

In the same announcement, the Delft team already indicated a possible shift in paradigm as they asked the following questions: 'Can we distinguish certain more or less proven methodological approaches and paradigms for Research-by-Design? And if the answer is yes, what are their aims, nature, validity and contents/products/insights in a qualitative and quantitative sense? What is their contribution to the production of new knowledge and ways of acting as designers? Does it make sense to develop, teach and theoretically underpin these paradigmatic approaches/methods to establish more congruent design skills and make "designer(ly) knowledge" explicit in our fields, not only in Bachelor's and Master's teaching but also at PhD level?'

1   EAAE Charter on architectural research. Available at http://www.eaae.be/old/web_data/documents/research/120903EAAECharter ArchitecturalResearch.pdf
2   1st TU Delft - ARENA Architectural Research Network Meeting, 1 November 2013. Available at http://www.arena-architecture.eu/wp/wp-content/uploads/invitation_arena_tudelft_01nov2013.pdf

In the following section we shortly look back on how
architectural research has been developing over time and then
focus more in depth upon recent developments in relation to
research by design and research embedded in practice.

The early stages of architectural research

In the early years of developing architectural research and up till
around 2000, research was mainly seen as being an application
of theories and/or models. Schools looked for methods from
other disciplines and lacked the capacity to understand the own
strength of the discipline.

Halina Dunin-Woyseth and Fredrik Nilsson recently concluded
that 'In the initial phases, the schools of architecture began to look
for institutionalized ways to build up an academically oriented
profile. Some disciplines with more theoretically developed
foundations, especially the social sciences and humanities, offered
models that could influence or simply be imported into
architecture programs. What was considered "normal research" in
these disciplines was imitated, aiming at a theoretical foundation
rather than discovering what kind of knowledge architects needed
or already were developing (Hjort, 2002).' (Dunin-Woyseth and
Nilsson, 2014 p. 5)

Within this context research in history and theory of
architecture developed strongly within several schools as well as
research on building technology in more technically oriented
universities.

Again following Dunin-Woyseth and Nilsson, 'already in 1997 it
was concluded that "there is already a continuum from scientific
research to creative practice" (Frayling et al., 1997, p. 15). It took
however, much more than another decade before this continuum
really came into being by developments in creative practice
research, research by design and artistic research.'

Several schools were pushed by their ministry to develop an
active PhD program in Architecture. This happened e.g. in early
90s in Norway, from 2003 onwards in Belgium and from 2004
onwards in the Netherlands. The Nordic countries have been
playing an important role in these developments. They are
internationally well respected for their high level of design quality,
artistic undertakings, and architectural designs. This is a result of
the initiatives taken in the 90s. During this period the first joint
Nordic research training activities were initiated in order to gather
the small national research education programmes. Three week-
long Nordic research training courses were carried out in 1993,
1994 and 1996 on the foundational challenges relating to
architectural research. The first one in Bergen treated the
similarities and differences between architects "practices and

architects" research, the second one in Aarhus compared architects' research approaches to the approaches of other disciplines investigating the field of architecture, and the third one in Helsinki compared architects' research into architecture as a form of art. The Nordic Academy (NORFA) funded these courses. From 1999 till 2001, prof. Halina Dunin-Woyseth organized the Millenium Programme, a series of Nordic research education courses. All national courses within this programme were sponsored by the Nordic Academy for of Advanced Studies (NorFA / Nordisk Forskerutdanningsakademi). This Millennium programme mainly focused on establishing the identity of design thinking.

Recent developments

It is only recently that research by design, creative practice research and artistic research have received plenty of attention and support as a new paradigm. In Norway the series of international conferences "Sensuous Knowledge" (2004–2009 and 2013) organized by the Bergen Academy of Art and Design brought together many researchers from arts, architecture and design and is since its conception referred to worldwide. The Aalto University hosted the first SHARE (Step-change for Higher Arts Research and Education) conference in 2011 and the Aarhus School of Architecture has been hosting the fourth conference in June 2014. The Journal of Artistic Research was started in 2011. In the same year the seminal book "Routledge Companion for Research in the Arts" was published. All these activities stimulated projects and developments in artistic research. As was mentioned earlier on, in September 2012 EAAE (European Association for Architectural Education) established its Charter on Architectural research.

This follows a series of international conferences and endeavors. Without being exhaustive, it is worth mentioning the following events. In 2000 TU Delft organized the conference Research by Design (Nieuwenhuis and Van Ouwerkerk, 2000 and Langenhuizen et al., 2001). This was followed by The Unthinkable Doctorate (2005) Brussels, Belgium (Verbeke and Belderbos, 2007); Design Enquiries (2007) Stockholm, Sweden; Research into Practice Conference (2008) London, UK; EAAE/ARCC Conferences, Changes of Paradigms in the Basic Understanding of Architectural Research (2008) Copenhagen, Denmark (Gelting and Harder, 2008); Communicating (by) Design (2009) Brussels, Belgium (Verbeke and Jakimowicz, 2009); The Place of Research / the Research of Place (2010) Washington, DC, USA; Theory by Design, Antwerpen, Belgium (Vos et al., 2013) and Knowing by Designing (2013) Brussels, Belgium (Verbeke and Pak, 2013).

All these conferences together show a clear evolution in the field: from more theoretical discussions towards the appearance of more and more design and artistic projects and cases. All these conferences, projects and publications show that and how research in the creative disciplines is developing in a new paradigm where the act of designing and/or artistic creation is considered to become the main vehicle for creating new perspectives, knowledge, insight and understanding.

Furthermore, in Flanders, after signing the Bologna Declaration[3], the Flemish Minister of Education began a process to reform the higher-education system, and the Parliament adopted the new Higher Education Act in April 2003. New PhDs in arts, music, product design, and architecture (by design) were created. For all these disciplines, research has become increasingly important. Within this context, Sint-Lucas School of Architecture developed its research based upon (1) the idea of developing a field-specific academic identity and upon (2) an epistemology which is founded on the specific knowledge modes of architecture (Dunin-Woyseth and Nilsson, 2014).

When it comes to architectural practice, we can see that more and more offices initiated a dedicated unit for research and/or knowledge management. Examples include the Belgium office SUM Project and SUM Research, the Swedish office White, and many others. These offices are using research efforts to develop (or maintain) a competitive edge and initiate innovation in a fast changing economy.

Within this context, I will mention three examples of practitioners who include a substantial research effort in their architectural practice in order to either further develop it or to better understand what is going on.

Siv Helene Stangeland – an ADAPT-r fellow at Aarhus School of Architecture and designer/partner? in the the Norwegian office Helen & Hard – explores how the office came into being and how the key aspects of the office have been developing over time (FIGURE 01). The research will conclude by envisioning implications for the future.

97

3   The Bologna Declaration of 19 June 1999. Joint declaration by the European Ministers of Education. Available at http://www.magna-charta.org/resources/files/BOLOGNA_DECLARATION.pdf

Tom Callebaut – a doctoral researcher at KU Leuven, Sint-Lucas – is partner in the practice tcct located in Bruges, Belgium. Within his practice he was involved in more than 25 projects which included the design of sacred places. His research project explores, through new designs and projects, the deeper elements of such spaces and how generous spaces may play a role in communities (FIGURE 02).

Mo Michelsen Stochholm Krag – a doctoral researcher at Aarhus – explores how artistic interventions on houses which are due to be demolished can help maintaining memories from the past. This is especially important in these regions where population is shrinking (FIGURE 03).

Hence, in academia as well as in the architectural offices, a shift has taken place from looking and using methods from other disciplines towards building on the own strength of the discipline. In a similar way, during the last decade, the arts have been developing artistic research. In the seminal book ROUTLEDGE COMPANION TO RESEARCH IN THE ARTS (Biggs and Karlsson, 2010) Borgdorff (2010) describes the crucial aspect of artistic research as follows:

> Characteristic of artistic research is that ART PRACTICE (the works of art, the artistic actions, the creative processes) is not just the motivating factor and the subject matter of research, but that this artistic practice -- the practice of creating and performing in the atelier or studio -- IS CENTRAL TO THE RESEARCH PROCESS ITSELF. Methodologically speaking, THE CREATIVE PROCESS FORMS THE PATHWAY (OR PART OF IT) THROUGH WHICH NEW INSIGHTS, UNDERSTANDING AND PRODUCTS COME INTO BEING (Borgdorff 2010, pp. 45–46).

In the same book, Helga Nowotny – former chair of the European Research Council – confirms the endeavors in the arts:

> Research is the CURIOSITY-DRIVEN PRODUCTION OF NEW KNOWLEDGE. It is the process oriented toward the realm of possibilities that is to be explored, manipulated, controlled, given shape and form, and transformed. Research is inherently beset by uncertainties, since the results or outcomes are by definition unknown. But this inherent uncertainty proves to be equally seductive: it promises new discoveries, the opening of new pathways, and new ways of problem-solving and coming up with novel ways of "doing things", designing and transforming them. To put research (back) into the arts, to (again) make visible and explicit the function of research in the arts and in the act of "creating knowledge" (Seggern, Werner, Grosse-Bächle, & Studio Urbane Landschaften, 2008) is a truly ambitious undertaking, because it takes up a vision and a project that originated in the Renaissance. After centuries of

separation, it promises to close a loop. [...] But the techno-sciences, important as they are, are not alone in leading these explorations and pursuits. Artists have quickly realized the artistic challenges offered by hybrid forms and the vast domain of crossing the natural with the artificial. Most significantly, they extend their creativity beyond the range covered by the techno-sciences. True to the humanistic spirit of the Renaissance, they bring THE HUMAN back into this world that continues to be transformed by the techno-sciences and their societal impact. It is this HUMANISTIC IMPULSE that should continue to invigorate research in the arts. It has the potential to bring forth a new Renaissance. (Nowotny, 2010, pp. xix, xxvi, emphasis added)

In line with and parallel to these developments, prof. Leon Van Schaik has been developing a PhD by Practice Programme at RMIT, Melbourne, Australia. The programme has then been brought to Europe by the author and has been the core concept in the ADAPT-r project.

The ADAPT-r project – Architecture, Design and Art Practice Training-research – aims to significantly increase European research capacity in creative practice research and is funded under the Marie Curie programme of the European Community as an Initial Training Network (ITN). The research that is produced through the ADAPT-r ITN contributes to a wider research effort to increase knowledge, understanding and quality of research in practice based creative disciplines and its methods. Through training creative practice researchers in the explication and dissemination of tacit knowledge (Polanyi, 1966) and latent cognitive resources, the ADAPT-r ITN builds a new generation of creative practice researchers and research-led practitioners able to meet the current demands of contemporary Europe[4].

At the core of the project is research "in the medium" of architecture itself (Van Schaik and Johnson, 2011 p. 24). The research is developed on and through creative practice and is usually concluded with a proposition which includes a reflection on the implications for the future. As an ITN, the ADAPT-r project is one of the biggest EC funded projects in architecture.

[4] See www.adapt-r.eu

What brings the future?

Architecture is a discipline, which is forward looking. It is not interested in current realities but in possibilities and possible futures. As such it highlights aspects of reality in a different way than other disciplines. It works within existing constraints, challenges them and deals with them in a syncretic way.

Within academia as well as within practice, there is a growing interest in architectural research. This is especially the case when it comes to exploiting the strength of the core competence of the field: designing and designerly thinking. This means researchers face a period of intense explorations and investigation of not yet known ways and methods. At the same time, this gives the opportunity to innovate and find new opportunities. It is then critical that we, as a collective and a discipline, do not close down too quickly but take an inclusive and facilitating stance, allowing good ground for unusual and unconventional ways of researching. Architectural research is innovative by nature.

The ARENA meeting in Delft is yet another stepping stone to further strengthening our understanding and gaining confidence in using the specific skills of the discipline of Architecture as part of the research process/method. Also at other conferences we see more and more cases where the design activity and/or practice constitute a substantial part of the research process. Hence, the debate on research by design shifts from a theoretical and philosophical level to the actual research work in architecture.

epoch 5, 2000-2005

(1)

A mapping of the different stages of development of the Norwegian
office Helen & Hard - explores how the office came into being and how
the key aspects of the office have been developing over time
(made by Siv Helene Stangeland)

(2)

Kapel van de Ontluiking, Groot-Bijgaarden, a key project of the office tcct contributing to a deepening of Tom Callebaut's understanding of sacred and generous spaces (image by Luc Roymans).

(3)

A controlled ruin by Mo Michelsen Stockholm Krag

References

Biggs, M., Karlsson, H. (Eds.), 2010. The Routledge Companion to Research in the Arts. Routledge, Abingdon, Oxo Nowotny, H. (2010). Foreword. In M. Biggs, H. Karlsson, & Riksbankens jubileumsfond. (Eds.), *The Routledge companion to research in the arts* (1st ed., pp. xvii-xxvi). New York: Routledge.n, UK.

Borgdorff, H., 20 Nowotny, H. (2010). Foreword. In M. Biggs, H. Karlsson, & Riksbankens jubileumsfond. (Eds.), *The Routledge companion to research in the arts* (1st ed., pp. xvii-xxvi). New York: Routledge.10. The Production of Knowledge in Artistic Research, in: Biggs, M., Karlsson, H. (Eds.), Routledge Companion to Research in the Arts. Routledge, Abingdon, Oxon, UK, pp. 44–63.

Dunin-Woyseth, H., Nilsson, F., 2014. Design Education, Practice, and Research: on building a field of inquiry. Stud. Mater. Think. 11.

Frayling, C., Stead, V., Archer, B., Cook, N., Powel, J., Sage, V., Scrivener, S., & Tovey, M. 1997. Practice-based Doctorates in the Creative and Performing Arts and Design. Lichfield: UK Council for Graduate Education.

Gelting, A.K., Harder, E. (Eds.), 2008. Changes of paradigms in the basic understanding of architectural research: architectural research and the digital world ; EAAE/ARCC conference proceedings, 25th to 28th June 2008. The Royal Danish Academy of Fine Arts, School of Architecture : EAAE ARCC, Copenhagen.

Hjort, B., 2002. Hunderd Years of Swedish Architectural Research. Nord. J. Archit. Res. 4, 85–86.

Langenhuizen, A.M., van Ouwenkerk, J., Rosemann, J. (Eds.), 2001. Research by Design. Proceedings of the International Conference on Research by Design, Faculty of Architecture, Delft University of Techology, in cooperation with the European Association for Architectural Education. Delft University Press, Delft.

Nieuwenhuis, A., Van Ouwerkerk, M., 2000. Research by Design. Delft University Press, Delft.

Nowotny, H. (2010). Foreword. In M. Biggs, H. Karlsson, & Riksbankens jubileumsfond. (Eds.), *The Routledge companion to research in the arts* (1st ed., pp. xvii-xxvi). New York: Routledge.Polanyi, M., 1966. The tacit dimension. Doubleday & Company, Inc., Garden City, NY.

Seggern, H. v., Werner, J., Grosse-Bächle, L., & Studio Urbane Landschaften. (2008). *Creating knowledge : Innovationsstrategien im Entwerfen urbaner Landschaften = innovation strategies for designing urban landscapes*. Berlin: Jovis.

Van Schaik, L., Johnson, A., 2011. By Practice, BY Invitation: Design Practice Research in Architecture and Design at RMIT, 1986-2011. onepointsixone, Melbourne.

Verbeke, J., 2013. This is Research by Design, in: Design Research in Architecture, An Overview. Ashgate Publishing Limited, pp. 137–160.

Verbeke, J., Belderbos, M., 2007. The Unthinkable Doctorate. Hogeschool voor Wetenschap & Kunst.

Verbeke, J., Jakimowicz, A., 2009. Communicating (by) Design. Hogeschool voor Wetenschap & Kunst and Chalmers University of Technology, Brussels, Belgium.

Verbeke, J., Pak, B., 2013. Knowing (by) Designing. LUCA, Brussels, Belgium.

Vos, E. de, De Walsche, J. de, Michels, M., Verbruggen, S. (Eds.), 2013. Theory by design: architectural research made explicit in the design teaching studio ; [proceedings of the conference "Theory by Design" at Artesis University College Antwerp, 29-31 October 2012]. UPA, Univ. Press Antwerp, Antwerpen.