URBAN AND LANDSCAPE PERSPECTIVES

Isabelle Doucet · Nel Janssens (Eds.)

# Transdisciplinary Knowledge Production in Architecture and Urbanism

## Towards Hybrid Modes of Inquiry

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# Transdisciplinary Knowledge Production in Architecture and Urbanism

## Towards Hybrid Modes of Inquiry

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Editors

Springer

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ISBN 978-94-007-0103-8 e-ISBN 978-94-007-0104-5
DOI 10.1007/978-94-007-0104-5
Springer Dordrecht Heidelberg London New York



*Cover illustration*: Kenny Cupers

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

# Foreword

In their Editorial Introduction to a special issue of the journal *Futures* on transdisciplinarity (TD), Roderick Lawrence and Carole Després (2004) called it a word "à la mode". Their declaration is all the more striking because the term only came into wide use after 1972, in a book containing a typology created for the first international conference on interdisciplinary research and teaching in 1970. TD was defined as "a common system of axioms for a set of disciplines", citing the example of anthropology conceived as the study of humans (OECD, 1972). Over the ensuing decades, interdisciplinarity received more attention. Yet, transdisciplinarity began appearing in an increasing variety of areas, including futures research, team-based healthcare, and critical theory in humanities. It was also linked with new comprehensive paradigms, such as general systems theory, feminist theory, and sociobiology. Additionally, the label appeared on websites associated with areas as diverse as learning assessment, arts education, special education, mental health, rehabilitation, engineering, ecological economics, human population biology, informatics, knowledge organisation, and teamwork and collaboration. The connecting link is an effort to transcend existing disciplinary approaches with new theories, paradigms, or models.

Today, a number of organisations are advancing transdisciplinary approaches. The ideas of Basarab Nicolescu invoked in this book lie at the heart of the Paris-based Centre International de Recherches et Études Transdisciplinaires (CIRET), in a vision of knowledge, education, and culture informed by new worldviews of complexity in science (http://perso.club-internet.fr/nicol/ciret/). The international Academy of Transdisciplinary Learning and Advanced Studies (ATLAS) is devoted to advancing TD education and research for sustainable development and solving complex global problems (http://theatlas.org/). The Science of Team Science initiative in the USA, which evolved from an earlier transdisciplinarity initiative at the National Cancer Institute, is fostering collaborative modes of research and frameworks for health and well-being. The Swiss-based Network for Transdisciplinary Research (td-net) fosters research in partnership with stakeholders in society focused on socially-relevant problems (http://www.transdisciplinarity.ch/e/index.php). Comparably aligned with trans-sector stakeholder participation, the Australian-based Integration and

Implementation Sciences (I2S) network is working to create a new discipline providing knowledge, concepts, and methods for conducting research on complex, real-world problems (http://i2 s.anu.edu.au/).

This volume adopts the definition of transdisciplinarity in td-net's *Handbook of Transdisciplinary Research* (Hirsch Hadorn et al., 2008). Its publication is significant in two ways, signalled by the editors in their introduction to the book and individual chapters. First, it situates TD within the domain of architecture and urbanism. As interdisciplinarity and transdisciplinarity proliferated, special journal issues and books began tracing their genealogies and sorted through theoretical positions and practices within particular disciplines and professions. Like their counterparts in architecture and design, they have identified new approaches that challenge older paradigms of practice and internalist conceptions, enlarging and pluralising the subject. In the case of architecture, the task is doubled, with its dual identity as both discipline and profession. Like their counterparts focused on transdisciplinarity, they are also seeking to foster greater inclusivity and reflexivity through new modes of collaboration and mutual learning.

The second distinguishing contribution the editors highlight is the theme of hybridisation of knowledge production. Observing the increased number of hybrid formations, Dogan and Pahre (1995) proposed a theory of hybridisation. The first stage of the process, they argued, is specialisation, and the second stage is continuous reintegration of fragments of specialities across disciplines. Dogan and Pahre identified two types of hybrids. The first kind becomes institutionalised as a subfield of a discipline or as a permanent cross-disciplinary committee or program. The second kind remains informal. Hybrids often form in the gaps between subfields. Child development, for example, incorporates developmental psychology, developmental physiology, language acquisition, and socialisation. Hybrids may also beget other hybrids. Genetic epistemology is a hybridisation of epistemology and general psychology that has fostered new affiliations. Transdisciplinarity has heighted the hybridisation of knowledge by incorporating once excluded forms of knowledge, including the understandings of lay-people. It has also magnified the greater heterogeneity and relationality of knowledge today, recognising cross-disciplinary and multi-dimensional formations and affiliations at all levels, from the subdisciplinary to the meta and the global.

The editors and the authors are emphatic that transdisciplinarity is not a new instrumentality. It is a new mode of inquiry, practice, and learning that places ethics, aesthetics, and creativity inside, not outside, of disciplinary and professional work. It brings new objects into view, places practices into new configurations, contextualises and re-situates theory and learning, and incorporates social, political, and ethical questions once deemed beyond the proper sphere of research and education. The boundary work of transdisciplinarity is decidedly plural. It is generative, formative, and interrogative, catalysing critique and transformations of our modes of inquiry, practice, and education.

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# Chapter 1
# Editorial: Transdisciplinarity, the Hybridisation of Knowledge Production and Space-Related Research

**Isabelle Doucet and Nel Janssens**

Following a long period of ever-increasing specialisation, a need for more relational knowledge has become apparent. The hybridisation of knowledge production has become a widespread and intensively debated issue within the scientific and academic communities. With the breakthrough of systems theory,[1] a new epistemological perspective has been launched that seeks to understand the whole of the mechanism at work (system-oriented) instead of focusing exclusively on fragments and parts (object-oriented).

Likewise, there is growing evidence and awareness that the earlier established, discipline-bound epistemology alone cannot effectively deal with the world's complexity. This is not to say that the production of discipline-specific knowledge is no longer relevant. Quite the opposite is stipulated here. The so-called "Mode 1" form of knowledge production does not need to be abandoned, but rather *complemented* by a new form of knowledge production that focuses on the *combination* of different types of knowledge.[2] Such complementarity is also reflected in Basarab Nicolescu's description of transdisciplinarity (Nicolescu, 2002, p. 45):

> [T]ransdisciplinarity is nourished by disciplinary research; in turn, disciplinary research is clarified by transdisciplinary knowledge in a new and fertile way. In this sense, disciplinary and transdisciplinary research are not antagonistic but complementary.

That this combination of different kinds of knowledge production moves beyond a mere "putting things together" is expressed by the plethora of terms deployed to describe the different modes, methods, and degrees of combining disciplinary knowledge: *multi*disciplinarity, *inter*disciplinarity, *post*disciplinarity, *cross*disciplinarity, *trans*disciplinarity. Even if each single term deserves further

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I. Doucet, N. Janssens (eds.), *Transdisciplinary Knowledge Production in Architecture and Urbanism*, Urban and Landscape Perspectives 11,
DOI 10.1007/978-94-007-0104-5_1, 

attention, we will, in this volume, focus on the notion of *trans*disciplinarity, because it refers to a hybridisation of knowledge and modes of inquiry that, in our view, is of specific importance for the disciplines of architecture and urban planning. This is a notion that will be demonstrated throughout the various chapters of this book.

In this editorial, we will attempt firstly to define transdisciplinarity within the context of the book's theme and to understand the different components of which it is made. Secondly, we will focus on how the different chapters in this book contribute to or expand such understanding. Thirdly, we will explore how recent, existing, research endeavours, in our opinion, contribute to the understanding of architecture's transdisciplinarity, even if those efforts are processed under different banners. We will then conclude with a tentative proposal for furthering transdisciplinary research in architecture and urbanism.

## 1.1 Defining Transdisciplinarity

When researching transdisciplinarity (in architecture and urbanism), one quickly runs into a first obstacle; namely the absence of a clear-cut definition of transdisciplinarity, despite extensive debate and study. Different interpretations of the concept have been produced, often depending on how transdisciplinarity is distinguished from inter- and multidisciplinarity. However, notwithstanding this lack of a precise, articulated definition of the concept of transdisciplinarity, there seems to be a strong sense of the kind of knowledge production at work. Namely, one that turns around three major elements: the integration of discipline and profession (theory and practice) in knowledge production, the ethical dimension, and the importance of experimental, *designerly* modes of inquiry. As we shall see, these elements also appear as central in the definition of transdisciplinary research provided by the *Handbook of Transdisciplinary Research* (Hirsch Hadorn et al., 2008). The first two elements, integration of discipline and profession and the ethical dimension, are expressed in the first part of that definition (Pohl & Hirsch Hadorn, 2008, p. 431):

> [T]ransdisciplinary research is needed when knowledge about a societally relevant problem field is uncertain, when the concrete nature of problems is disputed, and when there is a great deal at stake for those concerned by problems and involved in dealing with them.

This is what architecture's and urbanism's complex agency and "being-in-the-worldness" is, of course, all about. It is, in fact, an intrinsic part of architectural and urban design. Architecture's complex engagement with the world, acting as it does as both profession and discipline, requires it to deal with a broad range of disciplinary and practical forms of knowledge. Not only does architecture allegedly balance between the two most extreme ends of the spectrum of knowledge production, namely arts and science; it also balances between individual agency (creativity, authorship, ideology, but also use) and work for a client (architecture is always commissioned, "on behalf of" and, certainly so in relation to urbanism, "at the service of"). Therefore, some authors claim that design is ahead of the game in matters concerning the hybridisation of knowledge production and dealing with different types

of knowledge. Wolfgang Jonas, in this respect, mentions that design is the art of dealing with scientific and non-scientific knowledge, with fuzzy knowledge, with outdated knowledge and with no knowledge at all (Jonas, 2003, p. 1). Acting as a discipline (theory, history) as much as a profession (practice), and having to incorporate this plethora of different disciplinary and non-disciplinary knowledge forms, architecture and urbanism, indeed, behave *par nature* in a transdisciplinary fashion.

Yet – and this is where the second element of transdisciplinarity enters – architecture does not always enhance its transdisciplinary output towards ethical/societal ends. It is precisely the split (rather than cooperation) between architecture as a discipline and architecture as a profession that has led to important ethical tensions and even democratic deficits. Architecture's criticality has been largely processed in an *inter*disciplinary manner, namely within the realm of the *discipline* of architecture – e.g. Critical Theory, social theories and ideology, and transcendental utopias – but this critique has not always survived well in the messiness of practice.

Therefore, the question of whether architecture would not benefit from identifying itself as a *transdiscipline,* seems most appropriate, if not urgent. Jane Rendell has argued that, as a subject, architecture encompasses several disciplines and brings together modes of research that are often kept apart (historical analysis and materials science, for example) and thus provides possibilities for multi- and interdisciplinary research. But Rendell has also emphasised architectural *design* as a particular mode of practice-led research; a disciplinary specificity that cannot be found in other types of practice or design (Rendell, 2004, p. 144):

> [O]ver the last decade research "for" and "into" design has developed non-problematically, partly because the work can easily be positioned within existing disciplinary modes in science and the humanities. Research "through" design has produced more debate and is currently being further developed in discussions around the relation between theory and practice.

Herewith, Rendell points to the third element of transdisciplinarity, namely the importance of research by design, or – in Nigel Cross' terms – "designerly ways of knowing" (Cross, 2001). When we, therefore, argue for a transdisciplinary approach to architecture and urbanism, it is precisely an attempt to explore that which is so specific about architecture and urbanism, namely the "specific[ity of] 'designerly way[s] of knowing'" (Findeli, 1999, p. 3) and their complex agency in the world. It thus relates both to the tensions between theory (discipline) and practice (profession), and the ethical dimension. One such *way* to do this is "research through (or by) design" (Findeli, 1999, p. 2).[3] Research *through* design is distinct from research *for* and research *into* design – the former referring to practice (typically research and development, oriented to a design application); the latter to theory (historical and theoretical perspectives on design) – in the sense that it brings to the centre of discussion questions about the role of practice in theory building and theory in practice (Findeli, 1999, p. 2; Rendell, 2004).

This designerly "method" is also suggested by the second half of the *Handbook*'s definition of transdisciplinarity (following the first part as given above), namely, by stating that the process for transdisciplinary research consists of three phases: problem identification, problem analysis, and "bringing results to fruition" (Pohl &

Hirsch Hadorn, 2008, p. 431). The designerly aspect has to do with the fact that these three stages do not necessarily occur in the given order, and with the fact that "bringing results to fruition" is not the same as problem-solving, and does not necessarily occur at the end of the research process. Rather, it takes place "in the course of the research process in order to enable learning processes" and is achieved "in the form of a real-world experiment" (Pohl & Hirsch Hadorn, 2008, p. 428), which is, indeed, what an architectural design can be considered to be.

Because (architectural, urban) design engages, both as a discipline and as a profession, with broader societal concerns (e.g. situated knowledge, participatory design, everyday practices), it therefore seems obvious that hybrid modes of inquiry are part of the knowledge landscape.[4] In the context of this book we use the broad understanding that, whereas *inter*disciplinary knowledge is located in scholarly environments, *trans*disciplinary knowledge production entails a fusion of academic and non-academic knowledge, theory and practice, discipline and profession.

The definitions of transdisciplinarity, adopted by the contributors of this book, appear in relation to design research (the act of creating, designing) or design practices (participatory, pedagogical). They are related to knowledge production, and often enhance the ethical dimension of design. For example, Michael Biggs and Daniela Büchler (Chapter 5) relate transdisciplinarity to New Paradigm research in architecture, and, more particularly, to practice-based approaches. Referring to both Häberli's and Gibbons' definitions of transdisciplinarity, they consider design's unrealised intellectual potential and effectiveness, while also referring to the situatedness of knowledge – the knowledge that emerges from a particular context of application, and which is not always locatable on the prevailing disciplinary map.

Julie Thompson Klein, outside the context of this book, has defined transdisciplinarity as the following (Thompson Klein, Grossenbacher-Mansuy, & Häberli, 2001, p. 7):

> [T]ransdisciplinarity is a new form of learning and problem-solving involving cooperation among different parts of society and academia in order to meet the complex challenges of society [...]. A practice-oriented approach, transdisciplinarity is not confined to a closed circle of scientific experts, professional journals and academic departments where knowledge is produced [...]. Through mutual learning, the knowledge of all participants is enhanced, including local knowledge, scientific knowledge and the knowledges of concerned industries, businesses, and non-governmental organizations.

Following Klein's description, Halina Dunin-Woyseth and Fredrik Nilsson (Chapter 6) relate transdisciplinarity to a "Mode 2" of knowledge production. They recognise in particular the relevance of "Mode 2" research, or transdisciplinarity, for design scholars as a new "in-practice model" of research, which has great similarities to design and thus allows for design professions to contribute to knowledge production from within their own intellectual identity.

The ethical aspect of transdisciplinary research is, so we believe, implicitly present in all the contributions to this volume. Some chapters, such as Chapter 2 by Tony Fry and Chapter 4 by Rolf Hughes and Ronald Jones, have further explicated this dimension: in Fry, by arguing for continual learning from situated problems, and, in Hughes and Jones, by discussing transdisciplinary knowledge processes

against the background of a so-called post-critical condition. Also, whereas Carole Després, Geneviève Vachon and Andrée Fortin (Chapter 3) elaborate on how urban planners, architects and social scientists can become "agents of change", Tatjana Schneider (Chapter 7), following Basarab Nicolescu and Roderick Lawrence, also emphasises the inclusion of the know-how of lay-people in such constellations. Even if perhaps only implicitly, we believe we can also read an unmistakably ethical dimension in Albena Yaneva's (Chapter 8) proposal to map controversies as a way to understand architectural issues by taking into account a complex set of agencies and stakeholders.

## 1.2 Introduction to the Chapters

This section provides a detailed reader's guide to the book, covering both its thematic structure and individual chapters.[5] The different chapters in this book elaborate on transdisciplinary knowledge production in architecture and urbanism from three perspectives. The first perspective is from specific (design) practices. The second perspective, by departing from design research and design methodology, explores the possibility of a "designerly way of knowing" in research. The third perspective investigates how transdisciplinarity and hybrid modes of inquiry can be embedded into design education. Here questions of format and representation once again come to the fore.

The first three chapters of this book link the issue of "other" or new ways of knowledge production to specific practices and their ethical stances (in the sense of how they engage with the world). Whereas Tony Fry introduces the idea of "redirective practice" in relation to architectural practice, Carole Després, Geneviève Vachon and Andrée Fortin demonstrate the working of transdisciplinarity in the context of an integrated practice of research and action through collaborative processes. Rolf Hughes and Ronald Jones then argue that contemporary designers might pursue greater responsibility, influence and relevance vis-à-vis complex societal concerns by designing transdisciplinary social, political, economic and educational "systems" instead of objects.

In "Getting over Architecture: Thinking, Surmounting and Redirecting", Tony Fry provokes us to think about what is left "unthought", or what is thought of in another way. In this essay, trying to think the yet-to-be-thought is not based on conformity to existing modes of scholarship. Fry's essay places architecture and urban design in a collective moment wherein the practices (including "sustainable" architecture) are shown to remain still deeply implicated in the unsustainable. In fact, architecture will be characterised as complacent and still dominantly sustaining the unsustainable. Moreover, it will contend that we, for all our differences, exist mostly in a condition of almost total unawareness of the age of unsettlement that we are entering. The chapter will also engage the idea of technics (as it enfolds design as well as technology, techno-science and the culture of technology) and the agency of design independent from the designing subject. To do this, it will look specifically at the ontological design of things and complexity as designed things

go on designing. Such thinking will lead us to look at redirective practice, and the aim of redirecting what a designing subject is and does. A reconceptualisation of what the designing of the designed should design is also introduced and supported by three case studies.

In "Implementing Transdisciplinarity: Architecture and Urban Planning at Work", Carole Després, Geneviève Vachon and Andrée Fortin develop the aforementioned argument that architecture and planning are predisposed disciplines and professions for implementing transdisciplinarity. They argue this by describing how GIRBa (Interdisciplinary Research Group on Suburbs in Quebec City, Canada) has managed to make operational this mode of knowledge production by issuing back and forth between practice-based research and evidence-based design through collaborative processes, in order to identify strategies for countering urban sprawl and its negative consequences on sustainability. This chapter relates how a transdisciplinary program of research and action gradually and almost naturally emerged as GIRBa's understanding of the complexity and multidimensionality of this space-related problem accumulated. The group went from the distinct production of interdisciplinary research, architectural and urban design schemes, and contractual applied research, to an integrated program of research and action where each type of knowledge nourishes each other in a truly transdisciplinary manner. The limitations and strengths of GIRBa's work are highlighted; namely its limited power within academia to implement design solutions and policies, in contrast with its assured capacity to empower decision-makers and future generations of architects, planners and social scientists with an understanding of the complexity of urban problems, and a concrete experience of how to operate within a transdisciplinary mode of knowledge production to identify solutions. Challenges facing both academic programmes and professional organisations in terms of revising teaching models and training methods conclude the chapter.

In "Modern 2.0 – Post-criticality and Transdisciplinarity", Rolf Hughes and Ronald Jones give an account of a graduate seminar on transdisciplinarity they led in December 2009, for the Experience Design Group at Konstfack University College of Arts Crafts and Design, Stockholm. Rather than deliver a pair of prepared monologues, they decided on a more dialogic mode of presentation. This chapter is the record of their conversation. Developing Jack Burnham's identification of a paradigm shift from an "object-oriented" to a "systems-oriented" culture, Hughes and Jones consider how contemporary designers pursuing greater responsibility, influence, and relevance might contribute to today's complex social problems. Their answer: by designing transdisciplinary social, political, economic, and educational "systems". In a global economy, the authors argue, the seductive promise of epistemological transformation is less significant than the transdisciplinary design team's capacity to impact meaningfully on urgent social, political, and ethical questions in ways beyond the reach of corresponding monodisciplinary, crossdisciplinary or even interdisciplinary initiatives. They discuss the increasing need to design transdisciplines "as interdisciplinary methods begin hitting walls, finding their own limits of relevance". Citing examples ranging from Hans Haacke's Rhinewater Purification Plant and Filipe Balestra's Samba Architecture project in

Brazil, to Freeman Dyson's vision of artists and designers in the near future using genomes to create new forms of plant and animal life that will proactively reverse the effects of global warming, their vision is that of a debugged modernism – a post-critical, transdisciplinary project – a "Modern 2.0" capable of "realistically rebooting the Modern dream of an attainable Eden".

The following two chapters develop the second perspective, namely the relation of transdisciplinary knowledge production with the development of research in (architectural) design areas. The chapter by Michael Biggs and Daniela Büchler discusses a reconceptualisation of architecture as a culture of knowledge in its own right. Halina Dunin-Woyseth and Fredrik Nilsson discuss the potential of transdisciplinarity for practitioners in various design professions, leading towards an inclusive model of research that can emerge from more practice-based approaches.

In "Transdisciplinarity and New Paradigm Research", Michael Biggs and Daniela Büchler revisit their earlier survey of Swedish doctoral theses in architecture and urbanism, in order to discuss the outcomes in terms of what they tell us about the nature of transdisciplinarity in architectural research. The original survey analysed a sample of theses and generated a representation of the main cultures of knowledge with which architecture engages. Cultures of knowledge arise within communities that share common values, and which in academic research, form recognisable disciplines with their own research methods that have the potential to add knowledge in ways that are meaningful to that community. A dimension of creative practice was included in the representation, leading to two conclusions: that the presence of generic practice was not a unique characteristic of architectural research; and that creative practice is not accommodated by the research models that are used to manage generic practice elsewhere. The chapter reconsiders this representation and the earlier conclusions in the light of two definitions of transdisciplinarity, by Häberli and Gibbons respectively. The former is found to emphasise the disciplinary boundaries found in the original study. The concept of homogenisation in the latter could also be regarded as emphasising these boundaries, but invites a reconceptualisation of architecture as a culture of knowledge in its own right. In contrast to Gibbons, the authors conclude that this reconceptualisation should be realised through a reassessment of the values of the architectural community, which will reveal what questions are meaningful to it and therefore what research methods it needs to develop in order to address them. This process is not a homogenisation of existing disciplines, but instead, an analysis that will result in a so-called new paradigm.

In "Building (Trans)Disciplinary Architectural Research – Introducing Mode 1 and Mode 2 to Design Practitioners", Halina Dunin-Woyseth and Fredrik Nilsson discuss Mode 1 and Mode 2 forms of knowledge production from the perspective of the authors' practice as educators at a doctoral level for PhD students based in the practice of architecture, design and the arts. It builds on a series of lectures and seminars which have explored the potential of transdisciplinarity and Mode 2 knowledge production for practitioners in various design professions, and focuses on various existing "knowledge landscapes" as well as on more recent developments in relation to emerging new modes of knowledge production. The article

attempts to grasp the meta-level issues of the new mode of knowledge production and the opportunities it presents with regard to design research. It discusses the development of architectural research during the last four decades together with the essential features of Mode 1 and Mode 2, and tries to relate these features to contemporary architectural and design theory, and various practices in architecture and urban design. As the "scaffold" for constructing this chapter, the authors propose to discuss, firstly, the Scandinavian development of the doctoral scholarship in architecture, and secondly, the international debates that have formed the backdrop to this development with regard to the three major modes of knowledge production: monodisciplinarity, interdisciplinarity, and transdisciplinarity. Knowledge production in the area of transdisciplinarity and creative practice was previously seen as being outside of research and scholarship, while developments in the last decade have made it possible to conceptualise the knowledge field of design and architecture in new ways. The authors consider that an inclusive model of research is emerging where more practice-based approaches are possible, that is beginning to achieve academic recognition as well as vital interest from practitioners.

The last two chapters are related to the theme of transdisciplinarity and hybrid modes of enquiry in design education.

In "Discard an Axiom", Tatjana Schneider presents a manifestation of the issues and problems transdisciplinarity confronts and is confronted with within the context of architecture, with a particular focus on the interface between education and practice, theory and praxis. In her text, these issues and problems purposely appear as fragments to illustrate quite literally the multi-facetted nature of different ways of doing: teaching approaches, ideology and architectural thinking, the organisation and expectancies of the profession, and teaching and design methodologies. Personal opinions are intermingled with notes from a series of design studios or instructions given to students; interviews are fused with theories and teaching; "I" is mixed with the voices of others, each of which is expressed in a different style – the voices of students (underlined text), teaching and writing collaborators (italic text) and "experts" (capital letters) – to be used as a reference guide throughout the text. The format, as a result (and despite its artificial construct), is a direct reflection on both the possibilities of a transdisciplinary approach and on what the author would see as the transdisciplinarity impasse. The text argues that architecture has eliminated chance, innocence, the unknown, and the ability to see that wasting time could be a positive thing. Over the last few decades, architecture has been introspective. It has isolated itself inside its black box, has progressively internalised discourse, and has put its entire focus on the building and technology. Architecture willingly adhered to rules and regulations, to client demands, until it was controlled entirely from the outside. Moreover, at the same time, it became fragmented into separate fields of knowledge. Yet architecture concerns the world. It sits within it and is embedded within it and depends on this world's knowledge. This chapter attempts to conceptualise processes that value "open-endedness" over "closedness", non-plan over tight-fit functionalism, soft over hard, games of chance over games of skill, disjunction and friction over problem-solving. By such means, it tries to

rethink and redefine architecture as a field of questions and uncertainties wherein these tactics become tools of change, of transformative action.

In "From Reflecting-in-Action Towards Mapping of the Real", Albena Yaneva, in the first part of her text discusses two possible ways of architectural enquiry: reflective enquiry (recalling a particular example from Donald Schön to exemplify his understanding of the term); and the mapping controversies method as an example for a hybrid self-exemplifying mode of enquiry. She draws a comparison between Schön's descriptions of reflexivity in the studio and the type of reflexivity implied by a mapping controversy exercise. She uses a real case study done by her students on Heathrow airport, but tells the story of what they did as if we were to follow them in the process of mapping a controversy. This description will aim at tracing some parallels with Schön's approach while illustrating at the same time what it means to engage in such a mapping (it is a social science enquiry into the complexity of design rather than a purely technical mapping of reality – the reader will be told that at the end). She then further explains the mapping controversies approach, its history and how this method has been used in design education. She illustrates how this type of social science is translated into design, and vice versa, how designers can inform controversy studies in a better way. In her conclusion, she discusses the object/thing distinction in an architectural context, and considers what design education can gain from similar exercises of visualising things as complex ecologies rather than static objects. She also argues for the need of more realistic and less meta-reflexivity-based approaches in design education.

## 1.3 Conclusions – Incitements (Agenda Setting)

The contributions in this book have not just articulated and studied specific aspects of architecture's and urbanism's transdisciplinary processes; they also seem to suggest the need to further such research. We can detect three important reasons for this: (1) because, as we have emphasised before, transdisciplinarity is *par nature* part of the process of architecture, and of design more generally; (2) because transdisciplinarity allows us to explore in greater depth the ethical dimension of spatial practices (for instance through involving cooperation among different parts of society and academia); and (3), because, apart from the ethical aspect, it recognises the aesthetic and creative dimensions of architecture (for instance through research by design). The latter refers to the difficulties faced by critical and transformative architecture practices to translate their critical, social project into appropriate, corresponding design proposals. However, it also refers to the difficulty of reconciling architecture's ethical and critical agency in the world with the designer's creative-aesthetic authorship. This is demonstrated by the somewhat cramped distinction between "good design" (socially engaged, participatory), where the aesthetic desires of the architect tend to get trivialised in favour of "what the people want", and those branches that over-emphasise authorship and design autonomy at the cost of ethical engagement. They are as far apart as the creative/engineering extravaganza of

post-political, star- or iconic architecture, and those community-driven designs that are nevertheless driven by the style-preferences of their creators (e.g. Community Architecture, New Urbanism, European neo-traditionalism).

Transdisciplinarity allows us to account simultaneously for architecture's ethical-critical agency and for its specificity in terms of creative authorship. It provides for alternative ways to process the ethical and critical in architecture and urbanism, rather than dwelling on artificial distinctions such as that between critical theory and projective practice, or between "good" and "bad" architecture.[6] Furthermore, it allows us to process creativity and aesthetics beyond the register of architectural autonomy.

Consequently, we believe that transdisciplinarity warrants further attention, particularly in architecture and urbanism. Therefore, rather than offering *solutions*, we consider the contributions in this volume as important incitements for the setting of a transdisciplinary agenda for architecture and urbanism. In doing so, we believe that we can build on other discourses and practices that, in our opinion, have delivered important – even if often only implicit – contributions to such agenda.

Firstly, we can think of the discourses and practices concerning everyday architecture and participation as important attempts to incorporate "the real" in architecture. Such discourses and practices traditionally have been embedded in the context of critique, empowerment, and dissent: induced by the works of, amongst others, Henri Lefebvre, Michel de Certeau, and the Advocacy tradition of Paul Davidoff, Henri Sanoff and Sherry Arnstein, and expressed by all sorts of grassroots, artistic, and social activists.

Secondly, architecture has recently undergone an important "pragmatic turn", and has thus revalidated and re-articulated practice. Such architecture, often collected under the banner of "architectural pragmatism" (Saunders, 2007), nevertheless struggles to provide a critical agenda. This is demonstrated by the contradicting interpretations of what exactly constitutes critical engagement and ethical agency in practice, perhaps most explicitly demonstrated by the plethora of so-called "pragmatopic" approaches (Ruby, quoted in Gausa et al., 2003, p. 488) that balance pragmatism and realism, criticism and utopia.[7]

Thirdly, several attempts have been made towards less reductive approaches to space and design; approaches that no longer *choose* between theory and practice as the ideal locus for critique, but, instead, allow critique to be processed in ways that are more complex and more entangled; approaches that advocate hybrid modes of inquiry. One can think of the hybridisation of nature and technology, engineering and the social, facts and values, human and non-human, and the explicit attention to agency in Science and Technology Studies (STS) and Actor-Network-Theory (ANT). Such approaches have in common their suggestion to approach architectural issues not according to predefined ideologies or (critical) theories but to study them as situated, complex gatherings of all sorts of agencies: expressed through notions such as Donna Haraway's "Cyborg" (Haraway, 1991), Bruno Latour's "matter of concern" (Latour, 2004) and by Latour and Albena Yaneva's study of "objects-in-flight", "controversies", or "hybrids" (Latour, 1993; Latour in Rania, el Hadi, Ramos, & Latour, 2008; Latour & Yaneva, 2008).

Additionally, one can think of practice-based research approaches that recognise practice as a valuable locus of disciplinary knowledge production – often inspired by notions like "the reflective practitioner" (Donald Schön), "the craftsman" (Richard Sennett), or "design intelligence" (Michael Speaks). But one can also think of recent debates on architecture and agency, which allow one to take into account the complex workings of architecture, incorporating many different agencies, while at the same time safeguarding criticality in architecture's placement in the (post-political) real (Doucet & Cupers, 2009; Awan, Schneider, & Till, 2011; Rendell, Hill, Fraser, & Dorrian, 2007).[8] Such approaches seem to suggest fully exploiting architecture's transdisciplinary nature as a way of discovering what a "concerned practice" consists of – in which theory is not renounced, and where reflective, ethical, and practical concerns interlace in one and the same endeavour.

Fourthly, transdisciplinarity, and the ethical dimension of design practice, have been at the heart of Design Methodology, in particular through the recognition of "design generations". The recognition, by Horst Rittel, of "second-generation design methods" reflected the reactions against the perceived ethical failure of the science-driven "first-generation design methods" inspired by systems analysis and systems theory (see Bayazit, 2004).[9] That Design Methodology gradually incorporated more societal and ethical concerns is demonstrated not least by approaches such as "design by society", and also, the influence of STS on design research. By referring to "proximate designers" (architects, planners, graphic designers and so on), as well as the complex networks and constellations in which they are always engaged, "design by society" brings an important ethical dimension into design: namely, it asks "how design [might] move into public debate, systematic inquiry, and institutional practices?" (Woodhouse & Patton, 2004, pp. 1–3). It does not merely acknowledge that a myriad of persons participate in design processes, including "undesignerly persons" (non-experts, laypersons) (Woodhouse & Patton, 2004, p. 3); it also examines how societal norms are built into design and how design can be or should be held accountable for its impact on society at large (Woodhouse & Patton, 2004, pp. 3–4).

In conclusion, we believe that these attempts and experiments with transdisciplinarity in architecture confirm the need to further elaborate above all three different yet related elements: accountability, representation, and contingency.

Now that politics and ethics are no longer limited to State bodies and institutions but rather distributed over all sorts of bodies and networks that are no longer accountable through traditional democratic channels (De Vries, 2007; Amin & Thrift, 2007), and because design practices are embedded in complex, networked and distributed endeavours, the issue of accountability is particularly important. One cannot just "add" ethics to design, rather one must explore ways in which to understand distributed politics, and therefore, how politics and ethics are processed and channelled through design.[10]

In order to map such distributed politics and the *changes* to the political landscape during the life of a (design) issue, representation grows correspondingly in importance. For design processes, this implies typically designerly agencies such as drawing and modelling, but it also implies a more explicit sensitivity for the

agency of writing as a way to bridge, even hybridise disciplinary and professional discussion.

Finally, we believe that, when countering the idea of design practice as a mere applied theory, and instead considering the architectural and urban question as hybrids, complex gatherings, and "messy undertakings", we should nevertheless not content ourselves with doing this alone. Both accountability and designerly, complex ways of understanding architecture's agency in the world should be confronted with the fact that, no matter how well we develop tools to deal with it, and thus account (take responsibility) for such complex engagements, we will always be facing the contingency of design, a "leap in the dark". Namely, we can never entirely predict what the design itself will result in and what effect a design outcome will have, which unexpected agencies may enter, and what surprises we can enjoy. So how can designers, despite insecurities about the effects of their actions, nevertheless act in a concerned manner and be held responsible for their actions? How can they engage with the world in an irreductive, complex, and *problematising* manner rather than in a reductive fashion? In other words, how can they allow for surprises and with it "other possibilities" and, thus, "hope" as necessary elements for the enhancing of architecture's projective capacity?[11] No matter how well our design methods may become in order to deal with the complexity of the world, as soon as it starts to aim to *control* that complexity and contingency again, chances for the unexpected, for events to emerge, are constrained, and with it, any possibility for change.

## Notes

1. Systems theory appeared roughly after the Second World War, and was preoccupied with complexity, connectionism, and adaptive systems.
2. See also the chapter by Dunin-Woyseth and Nilsson in this book.
3. In reference to Christopher Frayling.
4. This is what the *Handbook* calls a "cooperation within the scientific community and a debate between research and the society at large" (Wiesmann et al., 2008, p. 435), and see Doucet, forthcoming (2011).
5. The individual chapter contents are based on the abstracts as provided by the authors.
6. On the artificiality of opposing Critical Theory and Projective Practice, see Hilde Heynen (2007) and Ole W. Fischer (2007). See also the distinction made by the editors of the edited volume *Philosophy and design* (Kroes & Vermaas, 2008), between star-architects and the socio-environmental activists of Bryan Bell's *Good deeds, good design*.
7. "Pragmatopia" = "an alternative territory of architectural operation [...] resists the escapism of utopia [...][and] the automatism of the pragmatic [...] rolls out a new plane of events in order to enable action (*pragma*) to take place (*topos*)".
8. See also the editorial in *arq* vol.13, nr.2, 2009 on "Agent Architect"; and the fifth AHRA (Architectural Humanities Research Association) conference on *Agency,* 2009, University of Sheffield.
9. The distinction between generations comes from Horst Rittel (1972). See also the writings of, amongst others, Nigel Cross, Geoffrey Broadbent, Victor Margolin, and Richard Buchanan.
10. Such questions have also been addressed in the *Politics of Design* International Seminar at The University of Manchester, Manchester Architecture Research Centre, June 2010.
11. This is what Isabelle Stengers (2002) did when she suggested looking at interstices.

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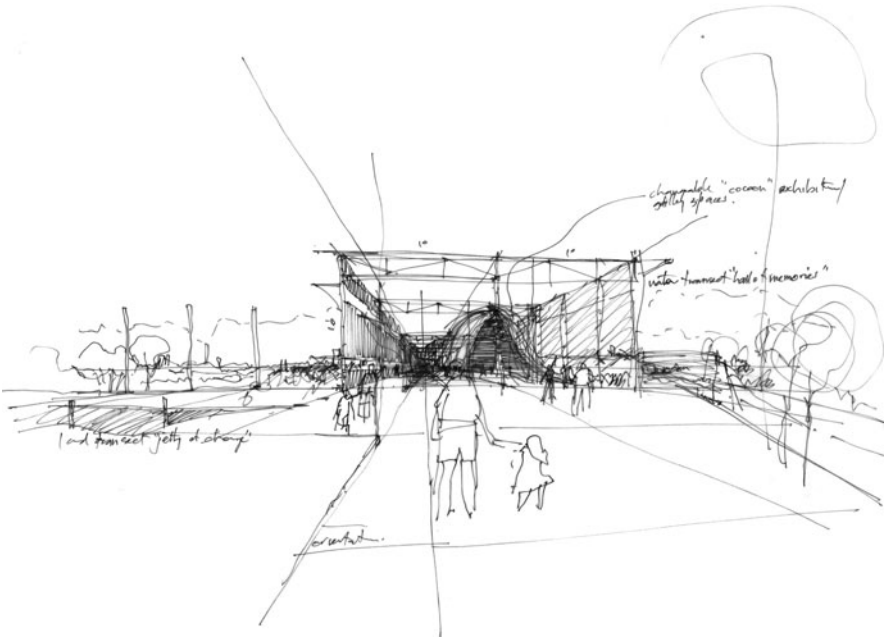
# Chapter 2
# Getting over Architecture: Thinking, Surmounting and Redirecting

**Tony Fry**



Hall view sketch – from gold coast competition entry [Jim Gall]

> *The more original the thinking, the richer will be what is unthought in it. The unthought is the greatest gift that thinking can bestow.*
>
> (Martin Heidegger)

What now follows is not only an invitation to think the unthought but to think what, for some architects, will be thinking the unthinkable. Of course, the term "thinking" trips off the tongue lightly, but this ease deceives. In actuality, there is a huge gulf

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I. Doucet, N. Janssens (eds.), *Transdisciplinary Knowledge Production in Architecture and Urbanism*, Urban and Landscape Perspectives 11,
DOI 10.1007/978-94-007-0104-5_2, 

between the evocation to think or the declaration that it is taking place, and any actual act of contemplative critical reflection. The unthinkable as architecture as we know it has to end if we and all we depend upon are to survive and flourish.

In following the winding path of the text most readers will not be traversing familiar territory.

The chapter starts with an introduction to "unsettlement" and related homelessness as a loss of the ground of architecture. Thereafter, how unsustainability is thought and engaged will be turned away from "a world to be saved" toward "a self to be transformed". In bringing these perspectives together, it then becomes possible to consider humanity at the dawn of a new epoch of earthly habitation – an epoch that demands new ways of thinking and designing able to deal with complexity beyond systems. These new ways will be presented respectively as "relational knowledge" and "redirective practice". In support of this exposition, design will be taken beyond an act of intention to be located in the ontological character of things (the designed that goes on designing). So repositioned, design will be deposited in a frame of understanding wherein it and technology are gathered under the rubric of technics. Here technology is understood to have transcended its material forms, become immaterialised and arrived as a mode of cognition. By implication, as will be made apparent, making distinctions "now" between human qualities and the qualities of things becomes increasingly difficult.

The sum of the observations bring us to a conclusion which acknowledges that in designing things "we" are also designing selves and that to exercise responsibility now means relationally comprehending and (re)directing "ontological design" as the dominant design paradigm (rather than being simply the existential condition of the designed). The text ends with three case studies that materially illustrate much, but not all, of what has been said.

Increasingly, it appears that the way modernising humanity has made "its world within the world" will end in absolute homelessness. There is no name for this defuturing condition; no recognition of what has been unmade by what human artifice has made. Whenever we create we also destroy: the "dialectic of sustainment" is one way of naming this. Without, we cannot take responsibility for what we do. So framed, the unsustainable is not just something we create, it is something we are.

Notwithstanding the limits of language and our categories of thought, deeply embedded as they are in another age (the Enlightenment), a sense of the inadequacy of how we understand "our" moment is now emerging. The problems we face are beyond the reach of reason. As finite beings with an uncertain finitude, we are finding that the realm of calculation and the exercise of technics are unable to deal with defuturing forces unwittingly liberated by "our" anthropocentric actions. There is no way to engineer us out of that negation that unsustainability names and defuturing delivers. Reason and technology just cannot transform what we have technologically become and the way our actions take *our* time away.

The challenge is ontological rather than metaphysical: it is a matter of changing what we are rather than just what we know and think. Knowledge and thought here become a means not an end. Thus, in this chapter, the approach to be adopted on how knowledge is constituted and applied will not be framed within a disciplinary

or trans-disciplinary context. Instead, it will be explored within a post-disciplinary, relational and strategic formation.

To confront the world within the world as a conceit, to recognise ourselves as unsustainable and to grasp the imperative of our own transformation – all of this profoundly transforms the agendas of architecture and design (and of almost all other areas of knowledge and practice). In the shadow cast by this daunting backdrop we will ask two questions and attempt to answer them. The first is: "how can the moment in which we collectively find ourselves be appropriately understood?" The presumption here is when such a question is asked, the attempt to answer it is usually circumstantially based rather than historical. The second question is conditional on giving a developed answer to the first. It asks: "what kind of knowledge are we able to create and deploy to understand our situation and how can its creation inform our actions, including our need for self-transformation?"

## 2.1 The Collective Moment, the Unsustainable and the Practice of Architecture

It is contended that in a condition of almost total unawareness, we, that is all of humanity, are living at the dawn of the age of unsettlement. For tens of thousands of years, our distant ancestors were non-settled – they were nomadic. For the past ten to twelve thousand years, human beings have increasingly become settled and urban. Over the next two centuries, this condition is very likely to change as a variety of factors combine. Many coastal dwellers will be forced to move due to projected sea level rises (at the March 2009 meeting in Copenhagen, the Intergovernmental Panel on Climate Change estimated that as many as 600 million people could lose their homes).[1] 750 million people are expected to lose their main source of fresh water as the glaciers of the Himalayas disappear (which controversially has been claimed to occur by 2035).[2] Heat islanding (rendering some cities unliveable), droughts, riverine floods, cyclones and other extreme weather events are equally expected to create hundreds of millions of "environmental refugees". It is perfectly possible that by the end of this century, a tenth of humanity will be displaced. But the problem does not stop there. As military strategic planners around the world are pointing out, having tens, or even hundreds of millions of displaced people crossing borders could trigger massive conflicts. In his book *Climate Wars*, Gwynne Dyer outlines a horrendous scenario of nuclear conflict as vast numbers of people from Southern China cross over into northern Russia.[3] More specifically and immediately in my own region, the most recent Australian Government White Paper on Defence considers that social instability in the Indonesian archipelago due to climate change factors will impact on the nation from 2030 onward – which is perhaps one of the reasons why the size of Australia's navy is being increased.[4] Additionally, continued world population growth, global expansion of consumerism and demands on natural resources (especially food) will constitute another problem of enormous proportions. Even if food can be produced in sufficient volume, it is likely to be increasingly expensive –

which is already the reason why the 1.02 billion people (the UN FAO figure) "living" on one to two dollars a day go hungry.

What is coming will radically change the human condition. The relative climatic stability of the last ten thousand years is at an end. No matter what is done now to mitigate greenhouse gas emissions, the zone of the unknown lies ahead. Perhaps the more rigorous the action taken, the lower the risk, but in a system only partially understood, this is not certain. What is clear is the following: greenhouse gases have an atmospheric life of 200 years plus; sea levels will go on rising for 300–400 years; and deep ocean temperatures (the planet's thermostat) take around 200 years to adjust. Secondly, there has always been a direct relation between human cultures and climate. If there are dramatic climatic changes one can expect equally dramatic cultural consequences, and the end of human settlement as we know it could be one of them.

Whatever happens, it will affect everyone. The human psyche will change. Insecurity will be a far more overt ontology. Mobility will be a generalised reaction to actual and possible dangers of many kinds. Many people will die. If such things happen, the significance of place and "community" will radically change. Certainly, the challenges to architecture are already moving far beyond the agenda of designing "green" buildings, "user centred design", the social construction of architecture by the user, the architecture of "hertzian" immateriality and the pragmatics of authorship by contingency – all of which continue to reify "the thing itself".[5] The claim here is that over the coming century and beyond, emerging climate defence structures and variable forms of transportable habitable containers are unlikely to be held in place by that idea, object and image that is "architecture". The line will be broken. Architecture will retain some of its "glorious past" but lose the prospect of a viable future. Rather than diminish challenges to design this situation will increase them, not least as the imperatives of the subterranean, the rapid and the mobile arrive to displace the dominance of fixed and permanent surface structures.

There is the possibility that things will not go as badly as outlined, although signs indicate the reverse. Rajendra Pachauri, Chairman of the Intergovernmental Panel on Climate Change has indicated that the impacts of climate change are turning out to be much worse than what we had anticipated earlier.[6] Certainly the "failure" of the Copenhagen Climate Summit at the end of 2009 does not bode well.

Here then is the situation that we need to start to try to understand. Obviously it is a fluid picture that will only become clear as events unfold. Action thus will have to be adjusted accordingly. Framed by this context and a concern with architecture, we can now move on to ask "what kind of knowledge are we able to create and deploy in this situation and how can its creation inform our actions, including our self-transformation?"

## 2.2 Architecture Now and Then

Architecture (including sustainable architecture) will be characterised here as complacent, and predominantly, sustaining the unsustainable.

It is complacent because it continues to project forward the integrity of its discourse and the agency of architects. There is a retained assumption that (1) it is merited and appropriate for architecture to be a discrete practice that creates a specific category of objects; and (2) that it is sufficient for architects to stay within a model of practice-based service provision and aesthetic gate-keeping of the form of the built environment. Such attachments mean that the architectural profession privileges the protection of its professional status rather than adapting to new, pressing needs that would challenge architects, requiring them to redirect how they think, what they do and what they know.

To illustrate the point, consider an architect receiving a commission to design a "green building" for a corporation. S/he will likely design the structure taking account of site factors, orientation, passive solar issues, the environmental impacts of materials used, material recycling, the use of renewable energy technologies, solid and liquid waste management, water conservation, design for disassembly and building reuse, and so forth. The structure will then be built according to this design approach; it will be rated according to one of the many hundreds of environmental rating systems, and thereafter claimed as sustainable. But unless the actual activities of the occupants and organisations that it houses significantly advance sustainment, claims to sustainability are all but meaningless.

Metaphorically, such activity reduces architecture to the professional production of "the curate's egg" – that not all the egg is bad in no way prevents it being deemed a bad egg. Of course, when presenting these arguments to an architect the response is nearly always: "but as a service provider I have no power over what my client does". This kind of response reveals limitations that travel in two directions. It folds into the fact that most of the key design decisions are made even before the architect comes on the scene (like, for instance, the building's location, scale, use and required symbolic status). But even more significant, such a response exposes the architect as having made a choice – one based on remaining attached to the practice as it is rather than redirecting it (and by implication their own role) towards sustainment. As we shall see later, sustainment is something beyond what is currently signified by the term "sustainability".

The position adopted here asserts the need for the dissolution and reformation of architecture in the service of sustainment. Such change will not arrive via theoretically inflected critique somehow sparking an idealised moment of truth and thereby instantly transforming practice. In contrast, what will be advocated is the instigation of a process of informed and unstoppable practical redirective change able to reconfigure what architecture is and does.

### *2.2.1 Sustainability Sustaining the Unsustainable*

As a pragmatic, sustainability continues to be mobilised without critical reflection. The example just given on the relation between a building and the activity of the organisation that occupies it is one example. The more fundamental point is that the ability to sustain depends upon relational interactions (as they are understood as

ecologically in, and beyond, a biological sense). Ability, then, carries two connotations. First is the demonstration of an ability to think and design relationally; and second is the capability of positing what has been designed to function completely relationally within its particular environmental setting and use.

Such thinking, and its application, can only occur by following a transdisciplinary pathway to the production of relational knowledge – which is to say creating a form of knowledge that ends up dissolving disciplinary differences in the course of forming something new. Informed by Alfred North Whitehead's notion of relatedness; the rhizomatic complexity of Gilles Deleuze's thought; the plural and political ecologies of Félix Guattari, Paul Virilo and Isabelle Stengers; and the diverse inter-relational networks explored by Bruno Latour and Manuel Castells, "relational knowledge" strives to draw on and displace the placement of these discourses as they get specifically deposited in particular disciplines. The claim here is not one of attainment, but rather of a work in progress mobilised against the heuristic of illusory difference created by existing divisions of knowledge.

Emanating from the Enlightenment, modern knowledge was predicated upon divisions (first, between philosophy and science and thereafter, within each domain). As this process continued unceasingly, specialisms proliferated and relational connections became overlooked, obscured or totally erased. So while a great deal has been learnt, much has been forgotten. Likewise, and out of the same process, calculative reason has come to dominate. This has made instrumentalism hegemonic – hence the omnipresence of technology and the reduction of "sustainability" to technics.

In such a setting, to go forward thus partly means going back, not just to potentially recover forgotten knowledge but to gain a better understanding of the inappropriate structuring of much of the knowledge we have collectively inherited. We equally need to consider that to a very significant extent, we strive to make sense of the contemporary world through categories of thought produced during the Enlightenment hundreds of years ago. Because of the very different material circumstances, there can be a significant gap between the current way of thinking and what needs to be thought.[7] At the same time, going forward equally demands the creation of new knowledge – and it is essential to place this imperative at the very core of sustainment.

Unquestionably, in this setting there is a need to confront the unthinking of our thinking. We simply cannot take how we think for granted, or just "bolt" disciplines together. Our conceptual geometry has to be exposed. This means getting to the foundations of the way we think and grasping its directional force. In this manner, it becomes possible to gain an understanding of the underlying structuring of the structures of our practices.[8] More specifically, reflective practice can no longer just be a reflection upon what has been done, or even why. It has to be projective – it has to be a reflection upon the consequences of what the practice brings into being. As such, it is not merely a desired characteristic of a (designing) practitioner, rather it begs to become a more generalised ontological quality of the human agent.[9]

In sum, our aim is to become new practitioners with new knowledge and practices that can have far greater futuring capability than what architecture and urban design currently offer in their disciplinary confinement. The key to making this possible is the creation of a condition of "situated learning" by making a conceptual leap – into

a context derived from an analysis of those contemporary critical conditions within which design is implicated.

It is vital to grasp that situated learning is not a pragmatic but a rupture from a given practice opening into circumstantial acts of informed critical reflection centred on disclosing the problem of the problem. Thus it is no longer a matter of bringing a discipline or even a variety of disciplines to the problem, but rather of continually learning anew what the situated problem, once adequately defined relationally, demands to be learnt. Problems are thus never received, but always interrogated and redefined. Likewise, the practice never prefigures the form of the solution – hereafter, architecture never just begets architecture.

### *2.2.2 Technics and Design After the Subject (Designer)*

The material condition of designing anything now is the ongoing "designing of the designed" framed by the dialectic of sustainment. In other words, designing is enacted in conditions of creation or destruction produced by what has already been designed. We are directed by the discourse of design to become partly (only partly) aware of what design brings into being. But predominantly, we lack consciousness of what design destroys. In so many ways, the world of our creation, as it spreads globally, stands literally and metaphorically on a wasteland.

As epitomised by the architectural façade, so much of what is designed is concealed by its mode of revealing.

By far the most powerful force of design is ontological – all power posited with the agency of the designer is illusory. Predominantly and phenomenologically, designing occurs without knowledge or consciousness. The implication is challenging: designers of every ilk have to learn how to "design the designing of the designed". This means that ontological design needs to be seen and established as a common foundation of all design practices.

The designing of the designed can be understood in two ways: first, as unambiguously exemplified by architecture, that most of what is designed is a repetition (a continual designing of what has already been designed); and second, that our "being-in-the-world" (including our practices) comes to be designed as part of the ongoing designing of the designed.

Technics enfolds design, and is design, as well as being technology, technoscience and the culture of technology (as it constitutes that mode of being-in-the-world that is grounded in thinking technologically). In every instance, all manifest forms of technics ontologically design "things" and complexity. What this means is that technics goes ahead of us as a condition that prefigures the designing of the objects and environments that design how we act. Therefore, a great deal of what we design (and increasingly how we design) is over-determined.[10] As design designing, technics puts the future in front of us. In relation to such a given context, to set out to deliberately conceptualise forms of the future requires contesting how they are already prefigured. So understood, the designer is neither at the start of nor at the end point of design – s/he arrives in design (the designed and designing environment) with, although usually without, a predisposition to think the future. Such a shortcoming should not be seen so much as a limitation of the individual, but as a

criticism of how the subject position of "designer" is created (educationally and via induction into professional practice).

In the light of these comments it is not a matter of just gaining a more productivist, complex and trans-disciplinary knowledge of design itself, or even of inquiring further into the nature of design and the designed. Rather three connected and pressing demands to acquire knowledge are upon us.

(1) We need to grasp the implications of ontological design and respond to them. This goes beyond investigating the ways in which the designed goes on designing, to realise that what design designs, in the end and fundamentally, is us. While it is true that human beings have extended themselves prosthetically by the use of tools from time immemorial (and by what tools have been used to create) it is also the case that tools and what they have been used to create have acted back on their creators. The ancient toolmakers were shaped in body and mind by their tools. Now, the contemporary worker in numerous occupations is being physically and mentally changed by technologies that extend their central nervous system and hold them in place, compliant before a screen.[11] Such holding in place is not merely the active function of, for example, the workstation in relation to screen content, for it is also delivered by a mode of cognition whereby a worker has learnt to become technological in a metaphysical sense. For example, increasingly, technologies based on artificial intelligence act to structure modes of thought and action based upon mechanised and algorithmic instructions.
(2) We need to understand that what architecture brings to hand constitutes part of the "world within the world" that undermines our fundamental dwelling in the world. Rather than architecture being elemental to the kind of actions that resolve homelessness – it produces it in the long term. This is by replicating (even in the name of "green architecture") so much in the city that is unsustainable. Moreover, architecture and urban design represent a forgetting of what needs to be designed by their preoccupation with designing (for) itself. Effectively, the means (the designed) is taken to be an end. Architecture and urban environments are designing agents of worldly engagement and transformation. This agency cannot be reduced to the functions that architecture primarily serves because it exists in a much wider register of being, dwelling and action.
(3) We need to realise that technics, and thus all design practices, have become implicated in extending the industrialisation of memory.[12] Effectively what this means is that memory is being made a performative feature of technology and managed as information. Memory is no longer simply a quality of mind: it is elemental to a system in which we are just one agent. In fact, as Bernard Stiegler argues, technics does not aid memory: it is memory.[13] Now of course memory cannot be appealed to as a self-evident phenomenon – its forms are multiple and complex. So said, all things we bring into being by design embody memory – every building is designed from the memory of the practices of building construction. It arrives via what is remembered in an industrialised form (information and instruction) that gets posited in the building's materiality as that which can be read. According to Stiegler, technics are a compound

of the remembered. But at the same time, more recent technologies of memory have radically altered the ratio of embodied to disembodied memory. As disembodied memory has become increasingly relied upon, the human capacity to remember has diminished. This has not happened in isolation, but at the same time as a major loss of historical consciousness and thus historical knowledge. Central to this loss is "bit culture", which is a loss of narrative, and so of telling – it creates a culture of the forgotten and marks a means of forgetting. Narrative it should be understood is a key means by which ideas and knowledge travel – it orders and animates what is said and thus is not a mere delivery of information. Narrative is elemental to an "ecology of mind" – it depends on the knowledge a narrator draws on and the understanding gained by an audience by what s/he tells. A loss of the ability to narrativise places the future of mind (as a product of, and contributor to, the collective) at stake.[14] Memory is, in fact, now being objectified by design, as design is employed to create the technology of its embodiment and synthesis.[15] In this state of reification, memory (as information or data) is selected, edited, assembled and turned into a commodity to buy and sell. So as it is managed within such an industrialising process it is stripped of critical reflective capability.[16] The past is lost. Stored data, no matter its use, cannot substitute for historical consciousness narrativised. As George Orwell put it in *Nineteen Eighty-Four*: "who controls the past controls the future, who controls the present controls the past." Not only is memory a profoundly political entity, but contesting its form and ownership is a crucial and pressing political issue. This is not least because as memory is transformed so are we – thus when memory is externalised and reified (as with technics in the built environment) the ontological designing of our selves and our futures is equally transformed.

As should now be clear, the future is in danger by design. So constituted, the future itself becomes a danger and thus a negation of itself.[17]

## 2.3 Redesigning the Self, the Practice and Its Pro-duct

The kind of analysis outlined above, indicating on the one hand, escalating negative consequences of human settlement, and on the other, the limitations of existing forms of design thinking and architectural practice to deal with them, is prompting some to find another direction. One naming of this is "redirective practice".

Redirective practice aims to redirect what a designing subject is, knows and does.

Gradually, redirective practice is starting to be introduced into the curricula of design and architecture schools in Australia, the USA and a few other countries. Likewise, it is also starting to be adopted by a variety of professional design practices. While still at a path-finding stage, it is clearly being realised that it will become possible to combine redirective action with the development of economically viable futuring activity. As will be shown, there are indications of its potential as a transformative force – both as a way of thinking and as the basis of an ontological and metaphysical repositioning of architectural practice in relation to other design domains. Redirective practice has the potential to be the keystone of sustainment.

This repositioning can be understood in terms of two transitory, transformative moments, which together combine to produce a fundamental shift in what it is to be an architect/designer.

Moment One is the rupturing of the metaphysical linkage between the architect and architecture (or any other kind of design practitioner and the designed). What occurs in this moment delegitimises the knowledge that tells an architect *what to do* in order to achieve a particular architectural goal, and in so doing, defines those actions which create *a sense of self* as architect.

Moment Two carries the critique embedded in Moment One to the formulation of another kind of thinking. This thinking reveals the imperative of redirecting what all designing practices currently do, accompanied by an indication of what they actually now need to do.

Moment One is effectively an ontological unmaking, while Moment Two is an ontological remaking. These moments are however transitory in that they mark, and enable, the passage of one ontology (i.e. that of the architect) to another (that of the redirective practitioner). Once redirective practice is normative, the need for the transformative process clearly falls away. Likewise, once the redirected itself becomes the norm, the necessity of redirection fades and another designing ontology, yet to come into being, arrives.

Central to Moment Two is a shift in the understanding of the nature of design and what it brings into being. Rather than seeing the objective as bringing completed operative aesthetico-functional objects into a particular spatial environment, the intent is to subordinate whatever is created to the primary intent of making time. In other words, object, function and use are replaced by temporality and process – thus "the (end) product" of designing now becomes "pro-duct" (a (pro)forward-(duct)connection).[18] The critique underpinning this move – the taking of design towards "futuring" – comes from recognising the implication of design practices (obviously, including architecture and urban design) in "defuturing".[19] The future is being negated by design. Design practices have been complicit in speeding up the rate of production, which is indivisible from the acceleration of destruction. This process, named the "dialectic of sustainment", is inescapable – as already said, creation cannot occur without destruction. But what can be controlled is that which is actually destroyed and the rate of its destruction. In this context, decision-making can be seen as ethics materialised. If what is destroyed is systemically harmful, or can be replaced or renewed in volumes, then there may be no problem. Conversely if it is life-giving, vital and finite, then destruction equals disaster.

Although the "dialectic of sustainment" is an obvious feature of our making a "world within the world" it has mostly gone unseen and unconfronted – "our" anthropocentrically driven self-interests have deflected what we can (easily) observe and have concealed the seemingly obvious. Unsurprisingly, such thinking, including the notion of ethics materialised, has a primary critical focus within redirective practice. It may be that we can never be absolutely certain about what we really create or destroy, yet nonetheless the choice has to be faced and a decision made.

Clearly there are issues with how an architect, or any other designer, comes to engage with the ideas, issues and observations made here. As indicated, they could arrive via educational means (tertiary and professional) – not to supplement existing

knowledge but to replace it. This is not to say all past knowledge would be erased or repressed. Rather some would be revised, while much would be "archived" and thus would no longer be taken as a model for the creation of built and cultural environments.

Certainly, while redirective practice needs to arrive via institutional design and architectural education, its most significant realisation is likely to come through "situated learning". What this means is that the imperative to redirect (which will often end up as unavoidable) will become a driving force whereby what has been formally learnt becomes existentially known. Effectively, the concept of redirection, the unavoidable need for it, and the situation to be redirected would all merge to produce ontological designing. Thereafter, this mode of designing would become simply how things are and the way things are done.

## 2.4 Post-disciplinary Thought and Redirective Action: Three Examples

Now let us replay what has been argued in the abstract through three very different domains that beg redirection. The first is the redirection of existing cities; the second addresses the redirection of urban populations and how cities are brought into existence; and the third example concerns what we know.

### *2.4.1 Metrofitting*

Metrofitting refers to a comprehensive relational approach to retrofitting much of the material, immaterial and social fabric of the city.[20] As such, it provides a conceptual and organisational approach to policy-making, planning and design practices spanning the concerns of government, industry and communities. The intent of metrofitting is to prefiguratively and preventively take responsibility for the current and worsening situation. The cost of such action will be significant, but compared with allowing climate impacts to occur without doing anything this cost would be negligible. More than this, not to metrofit means at best, in global conditions of increased risk, accepting the prospect of crisis and thus relying on crisis management to deal with it, and at worst, a fatalistic capitulation to urban breakdown.

So contextualised, metrofitting is a strategic approach for putting a city in a position to adapt to climate change and its associated impacts. It is also about recognising that we need to find a way to change the existing urban social ecology (how decisions are made and how social relations are established, maintained and revitalised). Moreover, metrofitting is equally about: the transformation of the city's economy (with a bias toward localisation and improving the sustainment performance of industries, products and services); how social justice, equity and cultural sustainment are secured; and how prefigured crises are managed (like, for instance, a large influx of environmental refugees). But above all, it is about how we live and work together to secure a viable future.

Methodologically, metrofitting starts with a comprehensive analysis of the city and the threats that it faces – with the consequent information being used to create a continually reviewed risk map. An absolutely crucial point about metrofitting is that it is not a defensive exercise of seeking to secure a city "as it is", with its existing economy and modes of habitation. The content of metrofitting cannot be reduced to a pragmatic, physical engagement with the city and instrumental planning. It has to be significantly informed and directed by an act of imagining what a metrofitted city might be like. For this to happen, narrative and image have to be created, linked to a critical approach, and able to inform detailed planning and co-ordinated, well-executed designed action in space *and* time. Essentially, imagining what needs to be done should be prompted by an illustrated story of what might be possible.[21]

The metrofitting agenda is large. Besides "risk mapping" it spans actions like: critique of existing utilities for energy, water, waste management and transport; assessment of the quality of the urban fabric (and its ability to withstand extreme weather impacts); urban food production; the nature of the working day; fire risk and prevention; climate adaptive dress; educational reform (at every level); urban signage and public information; and demographic change (including the arrival of "environmental refugees" and "internally displaced people"). Of course, also part of the metrofitting agenda are professional development programs on redirective practice, based on situated learning, for a whole cohort of architects, designers and planners in the public and private sectors (including industry).

### *2.4.2 Moving Cities*

City move workshop [Tony Fry]

There are some cities that can be transformed in coming decades, but there will be a large number with no future. Cities that will be inundated with flood waters, too hot to be inhabited (because their thermal mass cannot be cooled), cities that will burn or be deprived of a water supply. And then there will be cities that find themselves in the path of conflict on such a scale that they become depopulated by fear or acts of destruction.

Such prospects are not mere fictions. Isolated examples already exist: Dhaka is at risk from rising sea levels; New Orleans arguably should have been moved after Hurricane Katrina; Adelaide could lose its water supply. As for fear, there are already millions of refugees in the world who have abandoned their home and cities in the face of actual or impending conflict.

That most of the events contemplated *might* be several or many decades away, is no argument against the need to start planning now. Obviously such planning should not only be directed at the city as a built environment. The issues of how a city's economy, culture(s) and community structures can be gathered then moved or reanimated in the age of unsettlement are of enormous importance.

## History Indicates That Adversity Brings People Together

The potential of making a looming danger facing the city apparent, if done well, could accelerate actions to move those elements of the city able to be moved, while, when possible, prompting the establishment of processes that could protect those parts of the city that can be saved. The approach could also include selecting objects of memory to mark the city as it was (or even the fact there was a city at all). However, above all, making the danger evident is about conceptualising and planning change and the ability of the new city able to house the IDPs (internally displaced people) and maybe external "climate refugees". This culturally complex exercise cannot assume the reproduction of conventional urbanism – for instance, it may have to be far more fluid and mobile in urban form created. Such action is also vital to trigger the slow process of creating a desire to move. Essentially the new has to be made a familiar idea. Obviously, what is lost has to acknowledge; but the potential gains of the new have to be projected. Opportunities for positive change would be identified and presented. Likewise, loss can be cast critically – most cities have problems they would like to lose.

In this context, planning is not merely an instrumental act, but an activity that can be socialised and generalised as a participatory "community constructing" sustainment practice. The making of the means of sustain-ability can also be the making of the means of belonging. Doing this in an emergent age of unsettlement will be a massive challenge. It requires overcoming a widespread nihilistic disposition toward the future, manifest in living hedonistically for the day – especially among the young. Likewise, it also implies finding ways to transport socio-cultural relations while over-riding investment in a particular place. These challenges link to what will likely be an overwhelming need to foster belief in the possibility of having an "affirmative future". Recognising that increasingly the future cannot be

assumed, such activity turns on establishing conditions of "futuring enablement" wherein people come together (with inter-generational intent) to take action that makes a viable future. Having a sense of a future and making a future here become indivisible. In this context, a generalised expression of sustainment essentially being about "making time" has to be generated and become generalised culturally. It has to become an ethos that parents hand down to their children who in turn pass it on to their peers. It has to become an understanding translated into everyday directive action – making time and living one's life thereby becoming praxis. While such action demands considerable attention, it remains currently beyond our ken. It can only be reached by embarking on the planning process indicated.

Actually moving many millions of environmental refugees, confronting (un)natural disasters on a scale so far unimagined, feeding huge numbers of people and providing water and energy – all of this presents problems of a magnitude that will invite despair, yet they have to be faced. They will materially arrive. Somehow, the structural myopia of almost all extant human societies will have to be displaced – eyes have to lift toward that future that is rushing toward us. Mid and long-term contingency and scenario planning has to be made a commonplace and flexible skill. Having said this such thinking has commenced.[22]

### *2.4.3 Rapid Cities*

Moving cities is, of course, only half the story. In every case, new construction would be needed – of both the material and social fabric of the city. Many cities might have elements of the old incorporated into the new to create some sense of continuity. Others are likely to be entirely new entities. Unquestionably, much will need to be built quickly. Two implications follow: first, the selection of sites for new cities and their design needs to prefigure disaster response planning (this should happen sooner rather than later – moving a city takes a long time); and, second, the rapid construction of such cities requires a great deal of research into building materials, construction methods, industrial systems design and delivery logistics.

The design imperative can be viewed in terms of meeting immediate needs and creating the conditions for the evolution of the city at a later date. This is to say, that the design of a rapid city does not have to deliver a totally resolved urban form, but rather, a substrate delivering a basic level of functionality upon which a proto-community could continue to evolve, design and innovate. This would mean initially providing a basic urban infrastructure and some key functional and symbolic structures, together with a vast number of prefabricated buildings that could be incorporated into permanent structures or removed and converted into new building materials.

Creating a construction industry for such cities is a massively complex exercise technically, logistically and economically – yet it must be done. The amount of material required would be vast; designing for different climates is challenging; storing and transporting building components on the scale needed is logistically

mind-blowing. So said, the exercise is not beyond contemplation. In fact, to some extent, it has been considered.

In March-April 2009, a European Union-funded "city move" workshop was conducted at Gellivare in northern Sweden – an area rich in mineral deposits. The workshop was organised by the Swedish Industrial Design Foundation and prompted by the need to move the town of Malmberget, which is slowly sliding into a huge chasm created by mining subsidence. When the town was established over a century ago it was not realised that a rich seam of the highest quality iron ore (magnetite) was directly below it. Blasting into the new ore body meant old workings collapsed – hence the pit that the town is falling into.[23] A key focus of the workshop was creating a new city and a desire to move. Among other things, this meant conceptualising a new economy (one of the problems of the area being a lack of economic diversity). One of the workshop's design teams created the concept of establishing a new city based on the manufacture of prefabricated building components for rapid city construction.

This industry was conceived to exploit two waste materials, rock and steel-mill slag, to manufacture pre-cast concrete building components. The rock was available from an open cast copper mine not far from the iron ore mine, and the slag, from a steel mill at a sea port one hundred and fifty kilometres away (this being the port from which pelleted ore from the mine in Malmberget is sent by rail). As the rail trucks return empty, transporting the slag would be easy. Likewise, crushers at the mine could reduce the rock to aggregate for concrete to form the basis of building components. As slag is a cementitious material, it could provide the other essential ingredient for making concrete. Because both the rock and the slag are waste materials from other processes (the rock from a local open cast copper mine and the slag from smelting iron needed to make steel) they are rated as having zero greenhouse emissions as these are assigned to the copper and steel.

In simple terms, the construction concept was to design prefabricated building components, build the required framework, cast the concrete, store the components mostly in containers at the port from where they could be transported to where they were needed (the containers themselves would also be used as building components). Of course, this method of construction could also be used to build the new city itself. Economically, the cost of such a provision could be met, in significant part, by cities under threat via some kind of futures levy.

Needless to say, this brief description gives very little sense of the great complexity of such an activity at every level (climatically, technically, logistically and economically).

## 2.5 Conclusions: Architectural and Design History and Theory

What has been put forward is more than just ways of producing knowledge to serve new modes of inquiry. It has been argued that emergent global circumstances place humanity at a turning point. This situation requires that new ways of thinking and

acting are created and enfolded into new practices – these being beyond architecture and urban design as they are currently understood. In very general terms this implies developing a new narrative and meta-practice able to reconfigure the nature and relations of existing practices while also providing overarching stories that enable wider understanding and greater cooperation. The intent of this proposal being not only to break those divisions of knowledge that obstruct relational approaches and solutions but also to build new dynamic working relations, conversations and futural knowledge.

Subsequently, this would expose new objects in need of inquiry that new thinking and redirective practice would be able to engage. While redirective practice can be seen as a common activity bridging specific practices it can be also viewed as linking particular and often divided domains of knowledge (which would be essential when working redirectively on a building, its use and its users). As such, redirective practice can be understood as post-disciplinary, in so far as it arrives as a discourse independent of any specific discipline. As a meta-practice it can also be viewed as bringing existing practices into a new formation, which is not merely formed across (trans)disciplines but exists as a "reconstitutive assemblage". This means it would exist counter to the fragmentation of faculties out of which modern disciplines emerged, but in a way that recognises the absolute need for knowledge to relationally interact. Rather than seeing this as harking back to an age of less complexity, such a model recognises that a relational mode of assembling knowledge is able to cope with complexity, and that more significantly, it is the most appropriate futural way to engage it.

As for the metaphoric-abstract discourses of architecture – that assemblage of ideas and metaphysical constructs that are projected onto architectural objects, practices and subjects, there is both a continuity (the past), closure (a loss of the present) and an opening (into the future). Certainly, many existing skills and areas of technical knowledge need be retained and enhanced. At the same time, how they are directed, who directs them and what they are used to create, all have to be dramatically changed and subordinated to a larger discourse and project.

Overall, there remains the question of what substitutes architecture once its institutional foundations fall before the ravages of unsettlement and the imperative of sustainment. Certainly the name will remain attached to things past, but the redirection of much of the present and the material form of the future will be beyond its claim and capability.

## Notes

1. Jean-Marie Macabrey, "Sea levels may rise faster than expected". *New York Times* ClimateWire (www.nytime.com/cwire), March 11, 2009.
2. Anjali Nayar "Climate: When the ice melts" *Nature 461*, 1042–1046, 21 October 2009 – this report, while now contested, is reduced to a question of "when" rather than "if".
3. Gwynne, Dyer (2008) *Climate wars*. Scribe: Melbourne, pp. 31–41.
4. Australian Government *Defence white paper*. Canberra, 2009, Section 9.2.

5. See for example architecture in the ontology of the virtual in Dunne (2005) *Hertzian tales.* Cambridge, MA: MIT Press; the progressive pragmatics of Till (2009) *Architecture depends*. Cambridge, MA: MIT Press; and the authorial power of the user in Hill's edited collection (1998) *Occupying architecture.* London: Routledge.
6. op cit, *Nature* October 21, 2009.
7. This is especially the case in terms of ethics. See Tony Fry (2009) *Design futuring: Sustainability, ethics and new practice*. London: Berg:, pp. 50–51.
8. A direct address to the structuring of structure is made by Pierre Bourdieu (1977) *Outline of a theory of practice*. (trans: Nice, R.) Cambridge: Cambridge University Press. However, it also underpins the very project of deconstruction as it exposes the foundation of thought upon which thinking stands – the seminal text here is Jacques Derrida (1974) *Of grammatology*. (trans. Gayatri Chakravorty Spivak) Baltimore: John Hopkins University Press.
9. Here we go beyond Donald Schön's (1983) seminal text *The reflective practitioner*. New York: Basic Books.
10. This is my reading of Stiegler's understanding of technics brought to design. See Bernard Stiegler (2009) *Technics and time 2* (trans: Barker, S.). Stanford: Stanford University Press, pp. 31–32.
11. Stiegler *Technics and time 2* p. 70 and p. 98.
12. Stiegler *Technics and time 2* p. 9.
13. Stiegler calls it "retentional finitude" p. 65.
14. Gregory Bateson (1974) *Steps to an ecology of mind*. London: Paladin, pp. 445–470.
15. Stiegler *Technics and time 2* p. 97.
16. Stiegler *Technics and time 2* p. 9.
17. The idea that one has to think of the future as danger – Derrida *Of grammatology* p. 5.
18. On the concept of Pro-duct see Tony Fry "Design ethics as futuring", *Design philosophy papers,* No. 2, 2004 (www.desphilosophy.com).
19. On defuturing. see Tony Fry (1999) *A new design philosophy: An introduction to defuturing* Sydney: UNSW Press and on futuring: Tony Fry (2009) *Design futuring: Sustainability, ethics and new practice.* London: Berg.
20. Tony Fry, Nora Kinnunen, Petra Perolini and Will Odom (2009) *Metrofitting: Adaptation. The city and impacts of a coming climate.* Brisbane: Griffith University, QCA.
21. This is not an invitation to author utopian visions – the emphasis has to be on what is possible. This mean there has to be a means to deliver the envisaged scenario. Utopias lack such means.
22. It was evident in the following activities: the EU-funded "City Move" project in Gellivare Sweden in March 2009 – the project brought 40 designers (including the author) from around the world to work on moving the city of Malmberget; the work of the Moving Cities think tank that has recently moved from Beijing to Shanghai; and in Gold Coast 2, the recent (October 2009) award-winning project of the Master of Design Futures Program Griffith University QCA, Brisbane with architects Gall and Medek.
23. Birgitta Svensson and Ola Wetteberg (2009) *Malmberget: Structural changes and Birgitta cultural Heritage Processes – A case study.* The Swedish National Heritage Board: Stockholm.

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# Chapter 3
# Implementing Transdisciplinarity: Architecture and Urban Planning at Work

**Carole Després, Geneviève Vachon, and Andrée Fortin**

Suburban Utopia, by Josiane Dufault & Mireille Duchesneau © GIRBa

## 3.1 Introduction

"Sustainable development" and "green buildings" are two popular locutions in the discourse of many politicians. Best practices are borrowed from countries around the globe, green certifications such as LEED (*Leadership in Energy and Environmental Design*) in North America are becoming the norm in architecture, public transportation systems are being built, and eco-communities developed. Yet, in Canada, greenhouse gas emissions and energy consumption per capita continue

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I. Doucet, N. Janssens (eds.), *Transdisciplinary Knowledge Production in Architecture and Urbanism*, Urban and Landscape Perspectives 11,
DOI 10.1007/978-94-007-0104-5_3, 

to increase, and the bulk of citizens drive a car to work and either own or dream about a single-family house. French sociologist Alain Bourdin (2009) affirms that our incapacity to deal with sustainability is due to our thinking in terms of *solutions* (technical, prescriptive), whereas in actual fact it is a *complex problem*. He further argues that architecture and planning have not yet embraced the complexity paradigm with regards to multiple contemporary urban configurations, uses, and representations. By neglecting the complexity of urban life, new problems have a propensity to be tackled using familiar concepts (e.g. centre/periphery model, neighbourhood-centred lifestyles), often leading to poorly adapted solutions.

Yet we are witnessing a unique momentum in urban research with a gush of studies that stem from important societal and urban transformations (e.g. urban sprawl, geographical mobility, ICT, innovative lifestyles, social diversity), as well as major theoretical, methodological and technical development (e.g. systems theory, interdisciplinarity, GIS). This new context has generated an abundant and rich scientific literature endorsing the complexity of urban phenomena. Why, then, has it not sunk into urban and architectural practices? We suggest that this is due to the persistent gap between scientific, professional and artistic knowledge, to the sectoral division of professional responsibilities in architecture and urban planning,[1] and to the rigidity of established disciplinary academic traditions. This chapter is about implementing transdisciplinarity to better define complex problems and identify customised solutions for sustainable development. It illustrates how the programme of research and action of GIRBa – the Interdisciplinary Research Group on Suburbs – constitutes an attempt to stimulate and improve collaboration between scientists, professionals and policy decision-makers, as well as to train urban planners, architects and social scientists to become "agents of change".

Our argument is that urban planning and architecture are both disciplines capable of a constructive dialogue with other domains of knowledge, including the natural and social/human sciences, due to their multidisciplinary position and action-oriented identity aimed at transforming the built and natural environment (Lawrence & Després, 2004). However, these professions' disconnected respective training models, i.e. the long-established design studio in architecture and the more recent "rational scientist" model in urban planning, make it difficult for these two disciplines to take full advantage of their complementary predispositions for transdisciplinarity, which could lead to a more effective and better-connected problem-seeking and problem-solving process with regard to complex urban problems. By presenting the programme of research and action that GIRBa has been conducting for the past 10 years, we want to illustrate with concrete examples how the group was able to bypass the rigidity of academic disciplinary training and narrow the gap between research and practice by conducting in an intertwined manner empirical research, design, and participatory processes on ageing suburbs.

After defining in Section 3.2 the concept of transdisciplinarity as well as the main characteristics of its mode of production, we discuss in Section 3.3 the nature of architecture and urban planning as multidisciplinary disciplines and action-oriented professions. Section 3.4 illustrates how GIRBa has built on the complementary nature of architecture and urban planning, as well as on their respective openness to multidisciplinary knowledge, to define its current research and

action programme on ageing suburbs. The last section highlights the strengths and shortcomings of implementing transdisciplinarity within academia's predominantly disciplinary mode of operation and its disconnected professional and research education programmes, pointing out challenges facing both universities and professional corporations in terms of revising educational culture.

## 3.2 Defining Transdisciplinarity

In what ways does transdisciplinarity differ from the more familiar interdisciplinary and multidisciplinary concepts? Indeed, the words multidisciplinary and interdisciplinary have been used consistently to denote scientific research that involves a number of disciplines. In multidisciplinary research, each discipline works in a self-contained manner, while in interdisciplinary research an issue is approached from a range of disciplinary perspectives integrated to provide a systemic outcome (Bruce et al., 2004). In contrast, the word transdisciplinary is not confined to scientific research and has been used since the 1970s in debates about teaching and professional practice. The Latin prefix "trans" denotes transgressing the boundaries defined by traditional disciplinary modes of enquiry. For German philosopher Philip W. Balsiger (2004), the focus of transdisciplinarity is on the organisation of knowledge around complex heterogeneous domains rather than on the disciplines and subjects into which knowledge is commonly organised. While research groups are generally defined as multidisciplinary in view of the diversified nature of their members' disciplinary education, the research conducted can be either multi, inter or transdisciplinary, the latter two implying that the final knowledge is more than the sum of its disciplinary components (Després, Brais, & Avellan, 2004).

French environmental psychologist Thierry Ramadier (2004) makes a distinction between the outcome of transdisciplinary research as "knowledge coherence" and the outcome of interdisciplinary research as "knowledge unity". For this author, instead of reducing reality to the parts researchable at the intersection of multiple disciplinary perspectives, transdisciplinary research includes at once what stands between disciplines, across disciplines and beyond any discipline, thus combining all the processes of multidisciplinarity and interdisciplinarity. For Balsiger (2004), implementing transdisciplinarity necessitates the replacement of strict research protocols with flexible methodological practices that stem from concerted dialogue around societal problems between academics, policy decision-makers and laypeople. Figure 3.1 recapitulates what Lawrence and Després (2004) identify as the recurrent characteristics of transdisciplinary research from the work of numerous researchers with various disciplinary backgrounds.[2] These are the dimensions of transdisciplinarity endorsed in this chapter.

## 3.3 Architecture and Urban Planning as "Undisciplined" Disciplines

The title of this section is borrowed from French architect and sociologist Daniel Pinson, in his contribution to the special issue of *Futures* on transdisciplinarity

1) Mode of knowledge production characterised by its hybrid nature, non-linearity and reflexivity, transcending any academic disciplinary structure.
2) Tackles complexity in science and challenges knowledge fragmentation, dealing with research problems and organisations that are defined from complex and heterogeneous domains.
3) Accepts local contexts and uncertainty; it is a context-specific negotiation of knowledge.
4) Includes the practical reasoning of individuals with the constraining and affording nature of social, organisational and material contexts.
5) Requires close and continuous collaboration between actors during all phases of a research project, through "mediation space and time".
6) Often oriented toward action, making linkages not only across disciplinary boundaries but also between theoretical development and professional practice.
7) Frequently deals with real-world topics, generating knowledge that not only addresses societal problems but also contributes to their solutions.
8) Generally aims at understanding the actual world and at bridging the gap between knowledge derived from research and decision-making processes in society.

**Fig. 3.1** Characteristics of transdisciplinary research according to Lawrence and Després (2004) © GIRBa

(Lawrence & Després, 2004). Although Pinson applies this qualifier to urban planning only, it is appropriate to extend its use to architecture.

### *3.3.1 The Case of Urban Planning*

When Pinson (2004) refers to the multidisciplinary character of urban planning as a profession, he brings forth three arguments. First, the initial academic training of urban planners is often completed in various disciplinary programmes. Second, planning programmes are themselves characterised by multidisciplinary curricula taught by faculty members trained in diverse disciplines (e.g. architecture, economics, engineering, geography, political science, planning, and sociology). Third, several urban planners work in multidisciplinary teams. The author points out the challenges brought by this explicit multidisciplinary position: (1) scientific knowledge about what constitutes the city in several fields must be accurately appropriated and constantly updated; (2) friction can occur during exchanges between the various disciplines represented in a planning team; (3) last but not least, planners are often questioned about the originality of their contributions. This author advocates that the capacity of urban planners to bring together knowledge from multiple disciplines in order to define complex urban problems in a relevant way should not only be highlighted but also developed in a more systematic way during academic training.

Pinson (2004) also affirms that the evolution of democracy has changed the conditions of planning practice, altering the connections between power and decision-making in relation to physical planning. It is increasingly difficult for urban planners to act as delegated experts working on the basis of scientific knowledge and judicial authority; working with citizens is now part of their responsibilities. Although the concept of "citizen participation" has been used since the early 1970s, namely with advocacy planning growing out of a reaction to the urban renewal movement in the 1950s and 1960s (Davidoff, 1965), a new intensity has been given to public participation since the late 1980s, prompted by societal problems and pressure from user groups (e.g. environmental activism, peace and conflict research, international cooperation, women's studies) asking for their know-how or tacit knowledge to be considered (Elzinga, 2008). Collaborative planning theory and practice arose in response to the inadequacy of traditional public participation techniques to provide real opportunity for the public to make the decisions affecting their communities. Collaborative methods are designed to empower stakeholders by actively involving them as legitimate decision-makers, along with public agencies, in the planning process. The aim is to reach consensus or at least an acceptable compromise (e.g. Patsy Healy, University of Newcastle-upon-Tyne, UK, 2005, 2007; Judith E. Innes, University of California, Berkeley, USA, 2003; John Forester, Cornell University, USA, 1999; Susan S. Fainstein, Columbia University, USA, 2000). Urban planners must be able to handle mediation tasks, mixing scientific and political interests. In Canada, the US and the UK, several urban planning programmes have been or are being adjusted to prepare future planners for these tasks. For those that are not, graduates are forced to learn in the course of job training where they are inevitably brought to work with citizens, not always with the best results. This competency should therefore be reinforced as an urban planning strength. With their respective books, *The Deliberative Practitioner* (1999) and *Collaborative Planning* (2005), US and UK planners John Forester and Patsy Healy have made significant contributions to help schools of planning with revising their curricula.

According to British architect Nigel Taylor (2007), urban planning was much closer to architecture before the 1960s. Both disciplines were then considered an art, albeit "applied" or "practical", in which utilitarian or "functional" requirements had to be accommodated. He associates this major shift to the 1960s, and summarises it as the replacement of a physical or morphological view of towns by a definition of cities as systems of inter-related activities. Cities here are considered to be constantly evolving rather than static entities, including social and economic activities, as well as a conception of planning as science rather than art, requiring specific training to support rational decision-making with empirical modes of investigation. One drawback of this shifting vision is that urban planning gradually lost its expertise on the physical aspects of projects. Indeed, despite the fact that the focus of this discipline was on planning the built environment, planners got more and more detached

from the design dimensions of their work, which required, beyond scientific knowledge and consensus-building skills, aesthetic and technical knowledge as well. For this reason, they have made a more limited contribution to physical interventions, and became commonly dedicated to regulations and master planning.

### *3.3.2 The Case of Architecture*

This situation gave way to a theoretical and professional reorientation of architecture toward urban planning in the last two decades or so, with a specific interest in project-making (e.g. Ian Bentley, Oxford Brookes University, UK; Andres Duany and Elizabeth Plater-Zyberk, University of Miami, US; Jan Gehl, School of Architecture in Copenhagen, Denmark; Bernardo Secchi and Paola Vigano, Venice University Institute of Architecture, Italy). It gave birth to urban design as a specific area of academic training now taught in various programmes around the world, including Laval University in Quebec city, Canada. As a field of professional practice, an important share of the contributions from urban design have been carried out by architects and architect-planners (and also landscape architects), owing to their capacity to formalise and materialise projects through the design process. The increasing presence of designers in this growing field of practice is sometimes considered threatening by planning educators who feel the invasion of artist-designers might jeopardise more "rational" and "scientific" approaches.

Thanks to the development of systems theory (Simons, 1969), complexity paradigm (Morin, 1977) and constructivist epistemology (Piaget, 1967), design is now recognised as a legitimate mode of inquiry that requires specific skills, knowledge and intuition to translate multidimensional problems into design solutions. In *What Designers Know* (2001), UK architect Bryan Lawson describes the specificity of design as the combination of both precise and vague ideas, systematic and chaotic ways of thinking, calculations, and creativity. Lawson qualifies design as interdisciplinary by its very nature, the smallest project making connections between a variety of factors, calling for different types of knowledge and involving several actors. Confirming the complexity of the process, US architect Robert S. Harris (1972) identifies five interrelated dimensions of any design project that correspond to different modes of inquiry for designers: ecological, societal, operational, experiential, and perceptual. The sequence with which knowledge is integrated into the design process is not linear but iterative, involving several loops in which hypothetical solutions are constantly adjusted with additional information brought by clients, users, decision-makers, and experts. For Harris, design decisions are a result of group interaction involving individuals who contribute their own creative insights: "The processes of design must allow for open and continuous externalization [sic] of ideas and information, and must welcome contributions from numerous directions and at all times" (1972, p. 1). This implies that designers must develop skills for working with others and assure that effective decision-making includes being able to hear what others are saying and respond constructively to one another. One specificity of design brought up by Lawson (2001), that supports designers in their collaborative work, is the use of drawings and images to not only convey their ideas

and converse with others, but to serve as a tool for problem-solving. Drawings and computer models are indeed not only used to communicate but also to build up knowledge on multidimensional problems and develop solutions. This creative process also calls for intuition. In his seminal work *The Reflective Practitioner*, US philosopher Donald Schön (1983) refers to a kind of "knowing in practice" or tacit knowledge possessed by practitioners, a "capacity for reflection on their intuitive knowing in the midst of action" and which they sometimes use "to cope with the unique, uncertain, and conflicted situations of practice" (pp. 8–9).

Although scientific and multidisciplinary knowledge is essential to the definition of complex design problems (e.g. sustainability), architecture students have less opportunity compared with planners to interact with researchers from the social sciences and learn to interpret scientific results from research during their education. Indeed, architectural programmes across the US and Canada are overseen by national architectural accrediting boards, which dictate considerably their educational content. Conditions for accreditation include 32 criteria for evaluating student performance classified under three realms: a) critical thinking and representation; b) integrated building practices, technical skills and knowledge; c) leadership and practice (NAAB, 2009). The criterion "understanding the role of applied research in determining function, form, and systems and their impact on human conditions and behavior [sic]" (NAAB, 2009, p. 22 - criterion a.11) was just added to the 2009 edition. Although the "ability to work in collaboration with others and in multidisciplinary teams to successfully complete design projects" (NAAB, 2009, p. 24 - criterion c.1) is also one of the criteria, it is more difficult to operationalise since faculty members are, with few exceptions, trained as architects (although their post-professional degrees might be in related disciplines). Indeed, because design studios constitute the heart of an architect's education, as a means for developing students' "proficiency in using specific information to accomplish a task, correctly selecting the appropriate information, and accurately applying it to the solution of a specific problem", educators must be able to teach such processes (NAAB, 2009, p. 21). As a result, few students have the appropriate training for searching scientific databases for specific cutting-edge knowledge and translating it appropriately to support decision-making, and most do not experience working in close collaboration with social scientists. This separation between research and design continues well into professional practice where architects' exposure to research is often limited to conference attendance and continuing education programmes. Lawson (2001) criticises the fact that despite its interdisciplinary nature, design often sits uncomfortably in the old-fashioned structures that he encourages us to challenge. Easier said than done! How can academics train architects and planners differently within existing educational cultures?

### *3.3.3 Narrowing the Gap Between Research and Practice*

Social scientists are generally trained to conduct and interpret empirical research early in their educational training. However, those involved in urban studies (e.g.

urban sociology, urban geography, urban anthropology, environmental psychology) are often disconnected from the applied world of planning and urban design, except for the expert opinions and research they might be required to understand. The gap between research and design, criticised over 25 years ago by Schön, seems to persist: "[. . .] research is institutionally separate from practice, connected to it by carefully defined relationships of exchange. Researchers are supposed to provide the basic and applied science from which to derive techniques for diagnosing and solving the problems of practice" (1983, p. 26). Again, academic institutions might have contributed to the situation. Even though multidisciplinary training is valued and encouraged – for instance at Laval University, ten percent of the total credit load must be acquired outside the student's main department – in reality, programmes are often competing for students, namely with regard to annual budget calculation methods, thus discouraging mobility across disciplines. On the other hand, topics taught in the social sciences often fluctuate according to both faculty research interests and the priorities of research funding agencies. This is the case with urban sociology, which used to be one of the strengths of Laval University's sociology program, but where no course on the topic is being taught anymore. This situation adds to the challenge of bringing together architects, planners and social scientists to work together on complex urban problems.

On the other hand, a growing number of architects and planners are seeking specialties beyond their professional education and, for this purpose, engage in a complementary research programme (Master's degree in sciences or PhD). In this manner, they are combining their competencies for collaborative multidisciplinary work and problem-solving with a capacity to conduct and interpret "scientific" research. They are becoming privileged knowledge translators, able to interact with social scientists and interpret research data in terms that can be understood by designers and integrated in the design process.

UK planner Patsy Healy (2007) challenges us "to make sense of the complexity of urban life" and manage "the dilemmas of 'co-existence in shared spaces'" (p. 3). GIRBa's experience suggests that together, architects, urban planners and urban researchers hold complementary sets of competencies that allow for implementing transdisciplinary research and action programmes that, in turn, could lead to identify creative solutions to complex urban problems. To reach this goal, however, we need to train the next generations of professionals and researchers to work closely together, and to show mutual respect for each other's knowledge and skills. How is it possible to do so within the disciplinary limits and constraints of architecture, planning and social sciences education?

## 3.4 Bringing Architects, Planners and Social Scientists to Work Together: The Case of GIRBa

This section presents a modest example of how transdisciplinarity can be operationalised within academia. More specifically, it tells the story of how GIRBa (in

French: Groupe interdisciplinaire de recherche sur les banlieues) came to implement a transdisciplinary programme of research and action at Laval University, in Quebec City, Canada, with the intention of identifying alternatives to urban sprawl and its negative consequences on environmental, economic and social sustainability. The programme of research and action emerged gradually and almost naturally as GIRBa's understanding of the complexity and the multidimensionality of the problem took shape. The group went from conducting interdisciplinary research, on the one hand, and architectural and urban design, on the other hand – two distinct knowledge production modes – to their integration into a transdisciplinary mode, issuing back and forth between practice-based research and evidence-based design through collaborative projects. In other words, GIRBa went from the distinct production of publicly-funded interdisciplinary research, contractual applied research, and architectural and urban design professional training, to being an integrated programme of research and action where each of the above contributes to the others in a truly transdisciplinary manner.

GIRBa is an academic research group that annually comprises around 25 members – professors, postdoctoral fellows and graduate students – the majority of which are trained in architecture and planning, but also in sociology, rural engineering, geography, political science, and environmental psychology. The group's headquarters are located in Laval University's School of Architecture, in the Faculty of Visuals Arts, Architecture and Planning. GIRBa is part of the broader Research Centre in Planning and Development (CRAD) that comprises 16 regular faculty-researchers teaching in the departments of social and human sciences, science and engineering, administrative sciences, as well as arts and humanities, along with about 50 graduate students and fellows.

### *3.4.1 A Context to Narrow the Gap Between Research and Practice*

In 1998, Carole Després, professor of architecture and urban design, and Andrée Fortin, professor of sociology, teamed up and were granted money from the federal agency SSHRC to study ageing post-war suburbs. Geneviève Vachon, professor of architecture and urban design, joined the team, as did Thierry Ramadier, a post-doctoral fellow in environmental psychology from Paris. The objective was to understand how people's residential biography and aspirations influenced their attachment to their home, and also how their use of a car for daily mobility influenced their experience and representations of the city, suburb and countryside, with a special attention paid to elderly suburbanites. The mode of knowledge production was interdisciplinary. The group addressed the multiple challenges of learning a common vocabulary since members held various disciplinary backgrounds, of establishing what was shared at the intersection of the disciplines involved in terms of theory and methods, of defining a consensual research protocol, and of identifying powerful interpretative concepts. Apart from several master's and doctoral students contributing to empirical research, professional master's students were working

in design studios on projects for retrofitting ageing suburbs, on the basis of what resident surveys, as well as demographic and spatial analyses, had revealed. In parallel, contractual research was being conducted by GIRBa's directors with the help of graduate students for suburban municipalities and governmental planning agencies (e.g. the development of intergenerational housing types, the revision of zoning regulations, and the analysis of suburban poverty).

After 3 years of moving back and forth between fundamental research, contractual research and design, we realised that not much had been published on ageing suburbs, neither in Canada nor in the US, and there were a lot of negative stereotypes circulating about these neighbourhoods and their associated lifestyles among architects and planners from both the private and public sectors. In fact, suburbs were being left out of various planning debates and new research directions. We thought our work could contribute to change the situation, at least locally. We wrote the book *La banlieue revisitée* (2002, in French), which we purposively addressed to a wide audience. Together, the chapters describe the morphology and origins of post-war suburbs, their demographic outlook, the activity of residents, and representations of housing and neighbourhoods, as well as propose sustainable design solutions to retrofit these suburbs.

In the meantime, GIRBa was granted 3 years of funding from one of Quebec's main research agencies, FQRSC, to coordinate its work around a programme of research and action on suburbs, with a strong emphasis on knowledge transfer. The grant was timely, just a few months in fact before the City of Quebec amalgamated with its surrounding suburban municipalities in January 2002. This gave GIRBa a unique opportunity to share its knowledge of post-war suburbs with decision-makers in a more active and structured manner. GIRBa invited decision-makers from key government agencies to take part in a collaborative planning exercise on the future of Quebec City's post-war suburbs. During the process, two other university colleagues joined the group, GianPiero Moretti, professor of architecture and urban design, Florent Joerin, professor of geomatics and head of the Canada research Chair in territorial decision-making strategy, as well as a post-doctoral fellow, Nicole Brais, specialised in urban geography and citizen participation. An important number of graduate students – researchers and designers – in architecture, urban design, planning and sociology also took part in the project.

Some additional contextual information will help understand why GIRBa was able to involve architects and urban designers in such a research and action program. First, Laval University was one of the first American universities to offer, 25 years ago, a 2-year professional master's programme in urban design to architects. Since then, the programme was opened to landscape architects, environmental designers, and more recently to planners. Second, in 2001, it became mandatory for architects across Canada to hold a Master's degree to access their professional order. Laval University's School of Architecture, with its well-established tradition of scientific research, took advantage of this additional academic requirement to introduce a series of elective one-semester specialisation modules led by faculty members specialised in particular areas of leading research (built heritage, programming, physical ambiances, construction, digital architecture, international

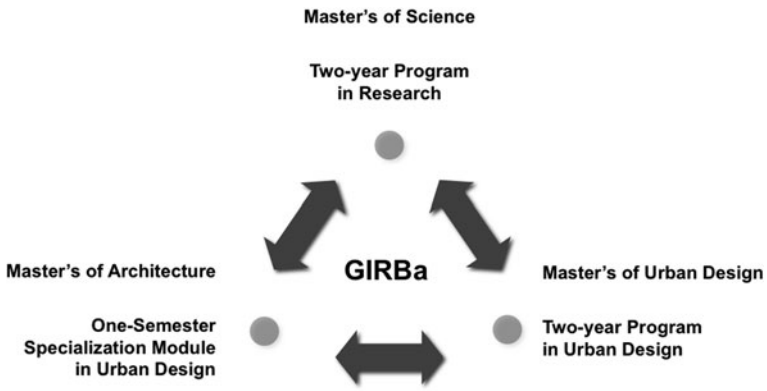


**Fig. 3.2** The functioning of the urban design programme and specialisation module at Laval University, Canada © GIRBa

cooperation, urban design). Since the three faculty members teaching urban design were GIRBa members, the research group gradually, and almost naturally, became associated with the education of urban designers. These combined circumstances contributed in drawing research and design closer together, allowing for a constant to-and-from between GIRBa's funded research projects, urban design studios and class assignments, and contractual research mandates. Since 2002, as part of mandatory urban design studios, about 30 graduate students have annually searched for original solutions to retrofit ageing suburbs and minimise urban sprawl, in collaboration with researchers and decision-makers. Several architectural and planning students have graduated since then with theses directly related to our research programme. Figure 3.2 illustrates the functioning of the urban design programme and the urban specialisation module at Laval University, Québec city, Canada.

### *3.4.2 A Research and Action Programme on Suburbs and Urban Sprawl*

In 2002, an 18-month collaborative process was put together, involving over 100 stakeholders in more than 45 activities. The ultimate aim was to build consensus around: (1) a diagnosis on ageing suburbs, (2) general planning orientations and means of retrofitting suburbs, and (3) a strategic revitalisation plan. As the process evolved, GIRBa conducted fast-track research to give a voice to tenants, teenagers, single-mothers and immigrants, as well as to families with young children who were under-represented in an initial survey. Overall, close to 500 citizens were consulted in face-to-face interviews, focus groups and through an Internet survey. GIRBa's graduate students were involved at all stages of the project. Their specific contribution varied according to their own disciplinary training, such as conducting relevant research and literature reviews and developing exploratory design hypotheses, identifying appropriate collaborative activities and organising planning sessions, and

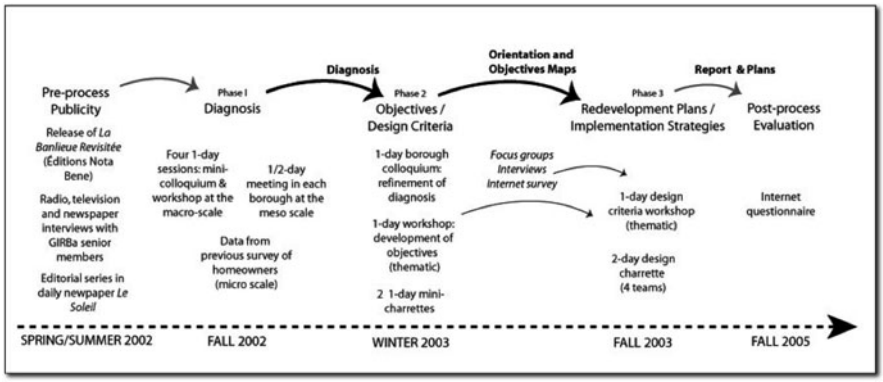


**Fig. 3.3** GIRBa's collaborative planning process on the future of post-war suburbs © Springer

building the communication plan. They also participated in the collaborative activities, which could involve presenting their own research and hypotheses, taking and transcribing meeting minutes, redrawing in-progress diagnoses, visions and design hypotheses, preparing the final reports, updating the website, and also taking care of logistical aspects. The project is presented in more detail in Després, Brais and Avellan (2004), in a special issue of *Futures* on transdisciplinary research. Figure 3.3 summarises the collaborative process.

In 2005, 2 years after completing the collaborative planning exercise, GIRBa posted an Internet survey on its website and invited all participants to evaluate their perception of the strengths and weaknesses of the process, as well as of the success of its outcome. The overall results suggest a very positive perception of the collaboration. Several key actors indicated that the general orientations, objectives and design criteria had made their way into their government agency, something that GIRBa was able to verify in their official documents and websites. The results are presented in a chapter of the *Handbook of Transdisciplinary Research* (Després et al., 2008). Although the GIRBa students' evaluation of the collaborative exercise was monitored in the survey, it is not considered in the chapter's analysis since we wanted to evaluate first the perception of non-academic participants. Nevertheless, both a debriefing meeting with all GIRBa's participants and the survey results confirm that the students were very satisfied with what they had learned throughout the process. First, they had learned a lot about suburbs. Second, they saw at work the respective rationalities and types of knowledge of different stakeholders, and realised how they can be complementary but also contradictory, revealing the complexity of the problem. Third, they learned how to plan and conduct a collaborative project through concrete experience. Fourth, students in social sciences learned to read maps and drawings and relate research data to specific geographical locations and intervention scales; designers learned to translate research data into design objectives, criteria or spatial concepts. Last but not least, students were able to start building up a multidisciplinary professional network.

This collaborative strategic planning exercise convinced GIRBa that in order to solve complex urban problems, four types of rationality and knowledge must be brought together, which Jürgen Habermas' *Theory of Communicative Action* helped us to articulate: (1) *scientific rationality and knowledge* or what is generally held as "what is true" (most often the result of empirical research); (2) *instrumental rationality and knowledge* which refers to practicality or to "what is possible", the knowledge of how to go about things; (3) *ethical rationality and knowledge* or "what is good", which is linked to customs, beliefs, values and past experiences that help people to determine what is wrong and what is right on a specific issue; (4) finally, *aesthetic rationality and knowledge*, or "what is beautiful", which comprises images and refers to aesthetic judgment and experience, as well as to tastes, preferences and feelings about the built environment. By bringing together stakeholders of these four types of rationality and knowledge in face-to-face interaction, a fifth type progressively emerged which was more than the sum of the four others since incoherencies in thought and arguments were revealed and collectively overcome. Figure 3.4 illustrates GIRBa's model of knowledge production.

GIRBa's transdisciplinary program of research and action is since then formally organised around three types of research: (1) *fundamental or scientific research* on suburban morphology, uses and representations; (2) *design research* mostly conducted in advanced urban design studios; (3) *collaborative* planning projects with municipalities, government housing and planning agencies, as well as with the population. Figure 3.5 illustrates the structure of the team's transdisciplinary research and action programme.

GIRBa's approach allows for blurring the frontiers not only between academic disciplines and designers, but also between academia, practitioners, decision-makers

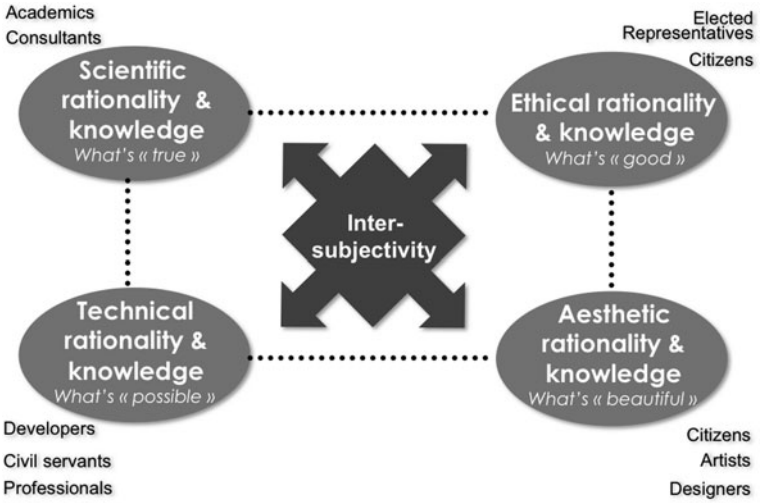


**Fig. 3.4** GIRBa's model of knowledge production for complex problems © GIRBa


**Fig. 3.5** GIRBa's transdisciplinary research and action programme on suburbs © GIRBa

and citizens. The group's experience in working on the issue of ageing suburbs strongly supports the following points: (1) *scientific research* is not performed in the same way when conducted in *close and constant collaboration between researchers from different disciplines*; (2) *design research* is a legitimate and autonomous way of producing knowledge for a given problem, one that accepts *intuition* and *uncertainty*; (3) finally, *action research* has proved to be an alternative mode of knowledge production that recognises *practical reasoning*, *material* and *organisational constraints*, and which values *public debate*.

### *3.4.3 The Limitations and Strengths of Operating Within Academia*

The limitations and strengths of GIRBa's work can be summarised as following: on the one hand, a limited power within academia to actually implement design solutions and policies; on the other hand, a definite capacity to empower future generations of architects, planners and social scientists and decision-makers with an understanding of the complexity of urban problems and a concrete experience of how to work in a collaborative manner as professionals, taking advantage of their respective skills and knowledge.

Throughout its involvement in community projects and citywide strategic planning, GIRBa earned respect from the population as well as from public and private planning agencies. The team received an accomplishment award from Quebec's Architecture Institute (Ordre des architectes) for its contribution to making suburban culture better understood by the profession. Faculty members and graduate students are frequently contacted by journalists to comment on new developments and projects in Quebec City, as well as by other municipalities in the province who

are also faced with the phenomenon of ageing suburbs. Carole Després is sitting since January 2009 on a task force mandated with developing a sustainable mobility plan for Quebec City; urban sprawl and increasing car dependency are at the heart of its concerns. Requested by the above task force, Geneviève Vachon was the head of two urban design studios in the autumn of 2009 with 30 Master's students reflecting on the types of environments that might favour sustainable mobility in Quebec City.

Over the years, GIRBa has become a real incubator for transdisciplinarity research for theses and studio projects, as well as a training centre that initiates future social scientists, architects and planners to collaborative planning and design. GIRBa students are trained to work differently, understanding the need for scientific evidence, technical and aesthetic knowledge, as well as ethical considerations. Our program of research and action is a good example of the potential contribution of universities in training professionals and researchers with different disciplinary backgrounds to work together, which may very well have positive effects on all levels of society. Several of GIRBa's graduate students are now working as civil servants in government agencies or in private firms in architecture, urban design and planning; they understand suburbs and are able to coordinate collaborative planning processes.

Ageing suburbs are now perceived as a valuable asset for the City, which is slowly endorsing a polynuclear urban model, with older suburbs acting as urban stepping-stones. The combination of quantitative and qualitative research, design and participatory processes certainly contributed toward a better understanding of the issues and challenges at stake with regard to the retrofitting of these neighbourhoods. The resulting "transdisciplinary" knowledge underlies the complexity of the problem and its multi-faceted reality. Even though a strategic plan for their requalification has yet to be adopted, several government authorities have explicitly integrated ageing suburbs into their policy orientations.

## 3.5 Conclusions

GIRBa's experience illustrates how students in architecture, urban planning and social sciences working closely together with decision-makers and stakeholders can make a significant contribution to understanding complex urban problems and identifying solutions for strategic planning. It constitutes an example of how academic institutions can play a leadership role in training future professionals to tackle sustainable development with approaches adapted to the complexity. The team has learned from its own experience that: (1) research competencies must cover the large spectrum of urban knowledge to increase architecture's chances of effectively contributing towards sustainable and durable cities; (2) architects, planners and researchers must be trained as agents of knowledge transfer; (3) design research must be considered as a legitimate way of producing knowledge; and (4)

professionals and social scientists should not only be taught not only how to work on collaborative projects but also how to put them into practice.

In *Les Sept savoirs nécessaires à l'éducation du futur*, Edgar Morin (1977) invites us to revise pedagogical models in order to deal with the complexity of our contemporary world. GIRBa's experience is an example of what can be done within existing academic structures, reminding us that universities are not only the locus of knowledge production but also of knowledge transmission; they are institutions where one learns to produce knowledge and to apply it (Lawrence & Després, 2004, p. 398).

## Notes

1. Urban planning is used indifferently from town planning or city planning throughout the text.
2. See also *Handbook of transdisciplinary research* (Hirsch Hadorn, et al., 2008).

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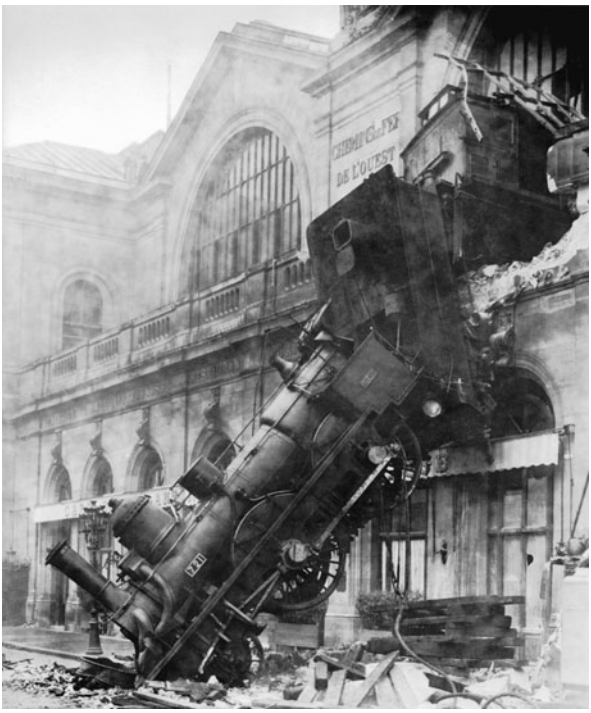
# Chapter 4
# MODERN 2.0 – Post-criticality and Transdisciplinarity

**Rolf Hughes and Ronald Jones**



Train wreck at Montparnasse Station, at Place de Rennes (now Place du 18 Juin 1940), Paris, France, 1895

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I. Doucet, N. Janssens (eds.), *Transdisciplinary Knowledge Production in Architecture and Urbanism*, Urban and Landscape Perspectives 11,
DOI 10.1007/978-94-007-0104-5_4, 

*In evaluating systems the artist is a perspectivist considering goals, boundaries, structure, input, output, and related activity inside and outside the system. Where the object almost always has a fixed shape and boundaries, the consistency of a system may be altered in time and space, its behavior determined both by external conditions and its mechanisms of control.*

Jack Burnham, "Systems Aesthetics" (1968)

## Preface

*Rolf Hughes and Ronald Jones presented the following assessment of current cultural entanglements as part of a graduate seminar on transdisciplinarity for the Experience Design Group at Konstfack University College of the Arts, Craft and Design, Stockholm, December 2009. Rather than deliver a pair of prepared monologues, they decided on a more dialogic mode of presentation. This chapter is the record of their conversation. Developing Jack Burnham's identification of a paradigm shift from an "object-oriented" to a "systems-oriented" culture, Hughes and Jones consider how contemporary designers pursuing greater reach, responsibility, influence and relevance might contribute to today's complex social problems. Their answer: by designing transdisciplinary social, political, economic and educational "systems". In a global economy, the authors argue, the seductive promise of epistemological transformation is less significant than the transdisciplinary design team's capacity to impact meaningfully on urgent social, political and ethical questions in ways beyond the reach of corresponding mono-disciplinary, cross-disciplinary or even interdisciplinary initiatives.*

RH: Einstein's observation that "The world will not evolve past its current state of crisis by using the same thinking that created the situation" strikes me as an observation that impacts directly on the condition of disciplinarity today. As Julie Thompson Klein has noted, there is a reconfiguration underway – involving both the dissolution and convergences of existing disciplines – a process that is helping reverse "the differentiating, classificatory dynamic of modernity" and creating instead an "increasing hybridization of cultural categories, identities, and previous certainties."[1] There are, as a result, a growing number of problems – and forms of practice – without a discipline per se. Many artists, designers and researchers today work outside established disciplinary practices. Existing metaphors, networks and technologies mutate rapidly from such forms of "post-disciplinary" border crossings. Hybrids blossom. These demand in turn greater capacities for *seeing connections* and thus a more responsive and nuanced set of theoretical perspectives. I'd like, then, to raise the notion of post-criticality as a background for our discussion of transdisciplinary knowledge processes, and since this term comes from architectural theory, let's first consider the example of architecture. Throughout the twentieth century architects have sought to define their role by aligning themselves to various positions within a paradigm of criticality, linked in turn to specific semiotic, representational and sequential ambitions. More recently however, architectural theorists such as Sarah Whiting and Robert Somol, Michael Speaks, Chris Hight and others, have suggested an alternative "post-critical" paradigm described as *projective*. Rather than emphasising dialectic and negative critique, projective architecture

claims to operate by seducing, instigating new events and behaviours – an instance of George Baird's call for careful reflection on "the respective roles of critique, innovation, authenticity, and expanded cultural possibility" which may then be integrated within "an 'operative' new theory of praxis for our times".[2] Michael Speaks' definition of "design intelligence" as "practices [that] allow for a greater degree of innovation because they encourage opportunism and risk-taking rather than problem solving" is one example.[3] This implies in turn a new kind of synthetic imagination, one that draws on the ability to work the boundaries between disciplines, to be alert to potentially useful nuances in the background "noise", to transform tools and methods in pursuit of new areas of relevance, all of which must surely leave our existing critical practices playing in vain a game of catch up?

RJ: I think back to the dramatic 1895 photograph of the locomotive wreck at Montparnasse as an analogy to where the practice of "criticality" has ended up. Whether criticality derives from the Frankfurt School, the French Situationists, the protracted critique of media culture, or postmodern irony, we have to ask – where is criticality, or "oppositional knowledge" currently positioned? I believe it's fair to characterise it using Cornel West's phrase "uncritical tribalism" - which he pinned to multiculturalism – a clique in such an absorbed state of self-satisfaction that it has lost touch. Consider, for example, Critical Design, which we typically associate with the work of Dunne and Raby, Troika, Martí Guixé, Jurgen Bey, and others. A routine example of Critical Design would be the t-shirt by Martin Margiela that reads: "THERE IS MORE ACTION TO BE DONE TO FIGHT AIDS THAN TO WEAR THIS T-SHIRT BUT IT'S A GOOD START". Really? Is this "good for me" self-indulgence, dressed up as a first thrust against a disease that has killed twenty five million people since 1981, really a *good* start?

RH: The phrasing, both imprecise and inelegant, is telling – the passive form means it remains unclear *who* does *what* – "THERE IS MORE ACTION TO BE DONE...." – an ellipsis on the very cusp of acknowledging its own political futility.

RJ: That's right. While the roses are being passed around in Critical Design circles we must admit that on the whole, these designers condemn themselves to manufacturing transgression against authority by consistently escalating old school radicalism, rather than by inventing new pragmatic and entrepreneurial systems that would directly intervene and empower change. If we look at truly wicked problems – global access to clean drinking water, for example - I am not sure what Critical Design's contribution would be. Another t-shirt? They have done no more than given themselves permission to re-arrange the deck chairs on the Titanic.

RH: Yes, we do welcome questions and comments from the audience, but please let us first flesh out our thoughts on the topic!

RJ: Critical designers stand where George Orwell placed Charles Dickens – both are masters of the platitude: *If men would behave decently the world would be decent*. If designers want to participate in reshaping their political, social, economic and

cultural futures they will have to begin to think beyond the exhausted forms of radicalism, beyond the stylistic tradition that limits their practice to a form of critical belligerence. That is nothing more than a blank virtue. Consciousness-raising or mere criticality may take the moral high ground, but it lacks the means or methods to achieve anything more. This means it can't meaningfully hold the high ground – and it is this, in my view, that is the core of this conversation.

RH: Bruno Latour critiqued the project of criticality in his important essay "Why Has Critique Run Out of Steam".

RJ: That's right – it should be required reading. So, to answer your question, designers, architects and artists must become proactive, offering substantial and actionable solutions drawn from multiple disciplines, possibly even transdisciplines, to the problems they abhor. We call this MODERN 2.0. Why? Not because we are interested in revisiting modernism – we are looking forward, rather than backwards, as we revise this second version of modernist ideals.

RH: A form of secular utopia.

RJ: Yes, because those ideals remain desirable. In this digital culture, 1.0, 2.0, 3.0 and so forth, represent not revisiting in the nostalgic sense, but revising to make a *new* and *improved* version. We have learned from the buggy first version of modernism to create this second version without the bugs. That is what MODERN 2.0 should imply – it is a metaphor.

RH: In a recent article on how designers are adopting the strategies of conceptual art, you cite Robert Pincus-Witten's distinction between ontological Conceptualism (advanced by Joseph Kosuth, among others, as an assault on art's very identity), and epistemological Conceptualism, which Pincus-Witten characterises as making or doing things "for the kinds of information, knowledge or data which things or activities reveal" – in other words, an emphasis on the experience of knowledge production rather than its ontological end.

RJ: Ontological Conceptualism might need a short explanation. Kosuth wrote in 1968 "Being an artist now means to question the nature of art", before declaring: "If you make paintings, you are already accepting (not questioning) the nature of art". This is why today, when you eat Thai curry made by Rirkrit Tiravanija or walk through a garden of black flowers planted by Jenny Holzer, you understand that the artist's identity has become inseparable from questioning their practice. Ontological Conceptualism today is everywhere – to the extent that it is no longer possible to speak about it in terms of influence.

RH: That's a useful clarification, but it's the perspective of epistemological Conceptualism that interests me here so I'd like to dig a little further into your argument in "Are You Experienced?", the *Frieze* article. Citing the increasing value

of experiences over commodities in the entertainment, airline and sports industries, as identified already in B. Joseph Pine II and James H. Gilmore's 1998 article "Welcome to the Experience Economy", you make the following claim: "the potential of this methodology to design experiences in order to project power and influence has been consistently underappreciated by artists, especially when compared with contemporary designers who co-opted epistemological Conceptualism as a platform for designing the experiences of knowledge production, reception and comprehension across disciplines – often furthest from their own – affording them an expanding sphere of influence. [. . .] The customization of epistemological Conceptualism represents the most significant paradigm shift in living memory, as design professions migrate from myopic design assignments – design me a toaster – towards conceiving the intangible commodities that feed the experience economy – design me a system."[4] Architects and urban planners do design systems, of course, but your point applies more widely than to architecture and urban planning as conventionally conceived – it is a belief we share, namely that "designers should be critical thinkers and strategists first, capable of addressing cross-disciplinary problems by designing the social, political, economic and educational 'systems' that give them greater reach, responsibility, influence and relevance."[5] This is a more expanded role for the designer than simply that of problem-solver; the problem-solver typically works within narrowly prescribed limits, while the creative entrepreneurs you are suggesting here must be highly skilled in synthesising information from a diverse range of knowledge traditions. They face problems that are neither predictable nor simple, but rather highly complex. And so, as Julie Thompson Klein has noted, "the art of being a professional is becoming the art of managing complexity."[6]

RJ: Let's compare critical theory to transdisciplinarity. In real world terms, transdisciplinarity must be entrepreneurial to survive; the hybrid discipline does not naturally evolve projecting power and influence, but must be created out of the very crisis, or obstruction, or riddle it pre-empts or resolves. By comparison, "critical theory", unable to actualise divergent thinking or disruptive innovation, seems little more than toothless compliance with prevailing attitudes about its own efficacy. Criticality (in practice and theory) has, many believe, dug its own hole; while actively critical, it is usually without creative alternatives to the object of its critique, e.g. "writing poetry after Auschwitz is barbaric". True, "normal" changed forever because of Auschwitz, but we need to ask *what is the new normal?* We have arrived at a point where critical theory is being called upon to answer a basic question: what is the continuing *value* and *productive* potential of criticality, or "oppositional knowledge"?

RH: What do you say to those commentators, such as Reinhold Martin, who argue that the arguments of "post-critical" theorists may effectively serve the interests of conservative forces? "Is it possible", Martin asks, "that the 'post-critical' polemic is, like the more general rightward swing in American politics, actually a rather thinly disguised effort to bury the utopian politics of the 1960s once and for all? In other

words, is it possible that all of the relaxed, 'post-critical' Oedipality is – in direct opposition to the anti authoritarian Anti-Oedipus – actually an authoritarian call to order that wants once and for all to kill off the ghost of radical politics by converting political critique into aesthetic critique and then slowly draining even that of any dialectical force it may have inadvertently retained?"[7] What I'm wondering here is if there is a sort of irreducible irreconcilability between the project of criticality and its negation? A variation of Marx's eleventh thesis in *Theses on Feuerbach* – i.e. "The philosophers have only interpreted the world, the point is to change it."

RJ: That's the very point: *change*. And I would answer Martin by arguing to the contrary – post-criticality, framed as Modern 2.0, doesn't seek to further anaesthetise utopian politics but rather revive them in full consciousness, with pragmatic and actionable and of course *aesthetic* alternatives to the object of their critique. This is hardly new. In Orwell's 1940 essay on Dickens he makes this same point: "The truth is that Dickens's criticism of society is almost exclusively moral. Hence the utter lack of any constructive suggestion anywhere in his work. He attacks the law, parliamentary government, the educational system and so forth, without ever clearly suggesting what he would put in their places . . . And so far as social criticism goes, one can never extract much more from Dickens than this, unless one deliberately reads meanings into him. His whole 'message' is one that at first glance looks like an enormous platitude: If men would behave decently the world would be decent." This is the charge I would level against Critical Design.

RH: Orwell may be right, but there may also be a quality of Dickens' artistry that exceeds the type of instrumental application that Orwell is looking for. Orwell's phrase "unless one deliberately reads meanings into him" suggests to me a somewhat unimaginative, journalistic view of fiction – Zola riding steam engines or the likes of Orwell sleeping rough in Paris and London, purportedly to "tell it as it is" (different to Eton, one assumes). But if we think of a literary text as a device conceived to produce its model reader, as Umberto Eco claims, it may be that Orwell was simply far from Dickens' model reader. It's the classic rationalisation of the purpose of Art, capital A – if the quality of Dickens' imagination alters our way of looking at the world (yes, that's a big "if"), then Orwell's complaint about his lack of a systematic political programme seems less than generous. But I digress. What we are describing as Modern 2.0, is not a shift to the right and an abdication of critical engagement, as Martin fears, but rather a revitalisation of the modernist project. The difference is that now it has greater agility, nuance, and complexity than was possible under Modern 1.0. Why? Because it has the potential to align its methods to the sort of "wicked" problems that have thus far resisted the best minds working from the relatively myopic perspectives of mono-disciplines, that is to say problems that are defined by the absence of a 'stopping rule'.

RJ: What Orwell found lacking in Dickens was any actionable solutions to the misery he so accurately and artistically depicted. While it's true that what Orwell was missing in the art of Dickens remains rare enough, examples do exist – as in the

case of Hans Haacke's *Rhinewater Purification Plant* (1972) first exhibited at the Museum Haus Lange, in Krefeld, Germany. Haacke's project was a matter of direct engagement in greywater reclamation. He pumped the foul water released from the Krefeld Sewage Plant though an additional filtration system, making it clean enough for fish to thrive in, and thereby making evident that the sewage plant was, itself, collapsing the Rhine ecosystem. In effect, his project was not a critique but instead pragmatic and *post-critical* for having presented a scalable and achievable solution to a wicked problem. In hindsight it appears clear that Haacke designed a "post-critical system" for water reclamation and not simply an artwork. He merged the metrics for success from two disciplines – art and ecology – into a third, creating an instrumentalised hybrid. Is this a work of art or the pragmatics of greywater reclamation? Answer: both. Here Haacke establishes a significant criterion for transdisciplinarity; merging the metrics for realisation from at least two disciplines into a third and then satisfying them. *Rhinewater Purification Plant* is not merely a work of art or only a system for greywater reclamation. It is the embodiment of a transdiscipline.

RH: Let's dwell on this a moment, as it's an important point. We might contrast *Rhinewater Purification Plant* to the "consciousness-raising" that is typically criticality's *raison d'être*. Haacke's project, you say, presents evidence that satisfies the metrics of one of its component disciplines (greywater reclamation) thereby proving that the polluted water from the Rhine can be cleaned. In other words, the persuasive strategies of the arts have been supplanted by the evidential-based methods of the sciences – although persuasion, of course, remains important in the "framing" of the evidence (we encounter it, institutionally and discursively, as art work rather than as ecological research).

RJ: Jack Burnham's watershed article "Systems Aesthetics" is particularly instructive here: "Situated between aggressive electronic media and two hundred years of industrial vandalism, the long held idea that a tiny output of art objects could somehow 'beautify' or even significantly modify the environment was naïve . . . The specific function of modern didactic art has been to show that art does not reside in material entities, but in relations between people and between people and the components of their environment." Rebooted in our contemporary context – and this is like explaining Scripture - Burnham's pessimistic but realistic estimation of art's power to inspire change closes the door on criticality's relevance. It simply died of unlikelihood. But I also wish to temper this distinction by recalling Jean-François Lyotard's observation in *The Postmodern Condition*; raising consciousness is not self-delusion in and of itself where it permits access to decision-makers. And while he didn't say it, I will: then to take that opportunity to exercise the soft power at your disposal. You could think of the Gore-Bono relationship in this respect. In this argument, they have some measurable influence – access to leading politicians and other decision-makers – because they can instrumentalise soft power via concerts

and movies fed through a global distribution system. You could say that Gore-Bono have somehow taken to heart "Systems Aesthetics".

RH: Or, the critical reading, that they exploit ritualised, celebrity-endorsed hand-wringing as a form of brand-building while leaving the foundations of the problems they address untouched by capitalism's red claw. But let's try to draw a distinction here; criticality is almost always based on disciplines, whereas post-criticality is almost always based on *themes*. Agreed? I'm thinking here of Mark Taylor's recent piece in the New York Times, "End the University as We Know It".

RJ: Agreed. It's a significant indicator that we have interdisciplinarity or a transdiscipline at hand. Within a post-critical era, transdisciplinarity becomes the proactive instrument for designing systems for taking actionable decisions. And Mark Taylor in "End the University as We Know It" was one of the few to be alert to the implications of this. Here is as accurate a picture of the future of higher education as I've seen in some time. First he problematised the current state of graduate education: "Unfortunately this mass-production university model has led to separation where there ought to be collaboration and to ever-increasing specialization. Each academic becomes the trustee not of a branch of the sciences, but of limited knowledge that all too often is irrelevant for genuinely important problems." And then, in a post-critical spirit, he offers six actionable steps for reform – including this one: "Abolish permanent departments, even for undergraduate education, and create problem-focused programs. These constantly evolving programs would have sunset clauses, and every seven years each one should be evaluated and either abolished, continued or significantly changed. It is possible to imagine a broad range of topics around which such zones of inquiry could be organized: Mind, Body, Law, Information, Networks, Language, Space, Time, Media, Money, Life and Water."

RH: Burnham anticipated the point in "Systems Aesthetics" when arguing "Increasingly 'products' – either in art or life – become irrelevant and a different set of needs arise: these revolve around such concerns as maintaining the biological livability of the earth, producing more accurate models of social interaction, understanding the growing symbiosis in man-machine relationships, establishing priorities for the usage and conservation of natural resources, and defining alternate patterns of education, productivity, and leisure. In the past our technologically-conceived artifacts structured living patterns. We are now in transition from an *object-oriented* to a *systems-oriented* culture. Here change emanates, not from *things*, but from the *way things are done*."[8]

RJ: Yes, the organisation of Taylor's "zones of inquiry" is a matter of creating relevant links through an interdisciplinary or possibly transdisciplinary system just as Burnham predicted. An early conclusion is that transdisciplinarity seems to emerge from three courses: (1) the transcendence of other disciplines to create a third hybrid, (2) as a portal or incubator for the creation of new knowledge, (3) as a research methodology (that does not necessarily produce a transdiscipline). So this is why

we propose, in the era of "post-criticality", a 2.0 version of Modernism's hands-on ambition to create a secular utopia.

RH: Instead of asking "what is it?" (the ontological/disciplinary question), we might ask "what does it do? what is it good for?" – practical questions that are concerned with potential action. And a secular utopia shifts our focus from critical theory's present informed by the past, to a speculative future – *what if. . .*? It is a pursuit of increasing degrees of freedom while navigating the gritty complexity of actuality (*what does it do? what is it good for?*). This type of projective thinking is impact-oriented; it favours action over empty gesture, it cares nothing for the distinction between creative and critical forms of practice, and, above all, it tests the appropriate *limits* of design practice. It is no surprise that religion comes into such a discussion – Mark Taylor is chairman of the religion department at Columbia. Donald Preziosi writes: "The 'divine terror' (*theios phobos*) that art, according to Plato, induced in the soul was simply the terrifying awareness of exactly this: that works of art don't simply 'imitate' but rather *create and open up* a world, and keep it in existence, as Heidegger put it in discussing the ontologically creative potential of artworks in his famous essay 'The Origin of the Work of Art', where the experience of art is taken to be fundamentally religious in nature. Or where, perhaps more precisely, the nominal common *distinction between* art and religion (or art, science, and religion) is itself problematized and rendered circumstantial rather than ontological."[9] Art, science, and religion also exemplify in differing ways the problem of *knowing*. Friedrich Hayek observed in *The Use of Knowledge in Society* (1945) that "Each member of society can have only a small fraction of the knowledge possessed by all, and each is therefore ignorant of most of the facts on which the working of society rests... civilization rests on the fact that we all benefit from knowledge which we do *not* possess. And one of the ways in which civilization helps us to overcome that limitation on the extent of individual knowledge is by conquering ignorance, not by the acquisition of more knowledge, but by the utilization of knowledge which is and which remains widely dispersed among individuals." Hence the lure of surmounting borders. In place of research that agonises over its identity or status, we try to nurture work that aspires to function in the world as *the difference that makes the difference*. We are seeing the first examples of this hybridising design logic emerging from our Experience Design programme at Konstfack.

RJ: Yes, and there's another methodology that nurtures transdisciplinarity that I should mention. As our audience knows from the early success we have seen in the Experience Design Group, it's becoming increasingly evident that future forecasting, or the use of analytical methods across multiple disciplines to forecast likely future scenarios five, twenty or even fifty years from today has become an invaluable tool and one that experience designers use with great expertise and efficiency. For example, we have been very curious about what future scenarios for design, talent, play, care of the elderly and many other topics might look like from the near term to beyond our lifetime. In the case of design, for example, if things continue to trend the way they are now, design will look very different seven to ten years out than

it does today. We suspect that the greatest difference will be the increasing need to design transdisciplines as interdisciplinary methods begin hitting walls, finding their own limits of relevance.

RH: I'd like to pursue this idea that design, or perhaps better *design thinking*, has taken over the mantel from conceptual art in exploring the implications of shifting focus from the *object* (artefact, collection or archive – library or database), towards *information*, including the question of how expertise is *actualised* (performed, articulated) *in practice*. Such practice changes the terms by which we describe, and conceive of, our various knowledge concepts and this in turn affects the way we set about what we call, at the Experience Design Group, *disruptive innovation*. We agree that design thinking is well positioned to make meaningful contributions to today's wicked problems, and that it requires a capacity to speculate critically where compelling *breakthrough knowledge* is likely to occur. How then do we move from design thinking to transdisciplinary innovation and action?

RJ: Transdisciplinarity – whether you think of it pragmatically as the proactive transcendence of existing disciplines in the name of creating a persuasive new hybrid discipline, or if you first think of it as a portal for nascent knowledge production and creativity, or perhaps as a speculative research method – however you conceive of it, transdisciplinarity is above all, as I mentioned, *rare*! I know of a few examples of transdisciplinarity; Daniel Kahneman's pioneering work in psychological economics comes to mind. I can paraphrase the citation for his 2002 Nobel Prize which reads something like: "for having integrated insights from psychological research into economic science". It has all the makings of transdisciplinarity; merging disciplines with low alignment - a hard science, economics, with a soft science, psychology – bringing with it the attendant high risk that the hybrid discipline will fail as if it were a matter of organ rejection, while equally, if oppositely, promising that if they take, as in Kahneman's case, it will produce a newly relevant, and influential practice.

RH: Burnham, in "System Aesthetics", has given us a very prescient series of observations – yet here we are more than forty years later and the same set of concerns might be raised anew. In the increasing number of disciplines that have been formed around no conventional "content" – logistics, statistics, game theory, network theory, decision theory and so on – do we see an acknowledgement of areas of human experience that remain beyond the crosshairs of criticality's scope?

RJ: There are changes afoot just now that will make transdisciplinarity increasingly attainable. And if it is not yet apparent, these will be sweeping changes; chief amongst them is (1) the backgrounding of conventional tasks asked of the creative disciplines – "Design me a toaster!" – to designing systems. Significantly this shift coincides with the emergence of a post-disciplinary culture where operational themes, not functionary disciplines, will define the creation of new systems and their relevant impact on the world, (2) art and design's increasing use of pragmatic

and proactive research to achieve entrepreneurial solutions to wicked problems, and most significant of all, (3) the emergence of "post-criticality". Synchronically, they make MODERN 2.0 possible.

RH: So where are the useful examples of post-criticality today?
RJ: Let me contrast two, one in the here and now, and the other in our near future. There is Filipe Balestra's Samba Architecture project in Brazil where, working with an NGO and the local community, a school was built in the Rio de Janeiro slum Rocinha –the largest of the city's 700 slums. Rocinha is home to more than 200,000 people. The school was built from a budget of twelve thousand dollars and is now active every day of the week. This meant that it was built outside the normal channels of architectural design and production, using participatory design, and a great deal of common sense. Balestra, who had enjoyed a successful career at the Office for Metropolitan Architecture, has initiated a similar project in Yerawada, a slum in Pune, India known as the Interdisciplinary Project for Housing Rehabilitation. Balestra is the future of post-criticality living in the present.

As a compliment to Balestra, consider Freeman Dyson's vision of artists and designers who will use genomes to create new forms of plant and animal life that will proactively reverse the effects of global warming. In the *New York Review of Books* Dyson writes: "If the dominant science in the new Age of Wonder is biology, then the dominant art form should be the design of genomes to create new varieties of animals and plants. This art form, using the new biotechnology creatively to enhance the ancient skills of plant and animal breeders, is still struggling to be born. It must struggle against cultural barriers as well as technical difficulties, against the myth of Frankenstein as well as the reality of genetic defects and deformities. If this dream comes true, and the new art form emerges triumphant, then a new generation of artists, writing genomes as fluently as Blake and Byron wrote verses, might create an abundance of new flowers and fruit and trees and birds to enrich the ecology of our planet. Most of these artists would be amateurs, but they would be in close touch with science, like the poets of the earlier Age of Wonder. The new Age of Wonder might bring together wealthy entrepreneurs like Venter and Kamen, academic professionals like Haussler, and a worldwide community of gardeners and farmers and breeders, working together to make the planet beautiful as well as fertile, hospitable to hummingbirds as well as to humans."

RH: So, a manufactured Eden in which we design increasing degrees of freedom? I'm sorry to adopt the role of Cassandra here, but certain critics (no, they won't give up yet!) also see in the rise of synthetic biology the potential for both *bio-terror,* such as the application of DNA sequences posted on the Internet to engineer a malicious new virus or biological weapons, and *bio-error*, meaning the unintended and perhaps unimaginable consequences of releasing all these gaily reproducing, synthetically-engineered organisms into the world.

RJ: With a post-critical approach, artists and designers take a hand in creating entrepreneurial and attainable solutions that are measurable by a kind of

interdisciplinary standard provided by other disciplines. In Dyson's example, the plants and animals that artists create may well possess great beauty, but their relevance must also be measured by other disciplines or transdisciplines, just as Haacke's Art (capital A) was also a successful engagement in greywater reclamation. As these future projects enrich the ecology of our planet, post-criticality will play its role, realistically rebooting the Modern dream of an *attainable* Eden.

RH: Amen to that. Any questions?

## Notes

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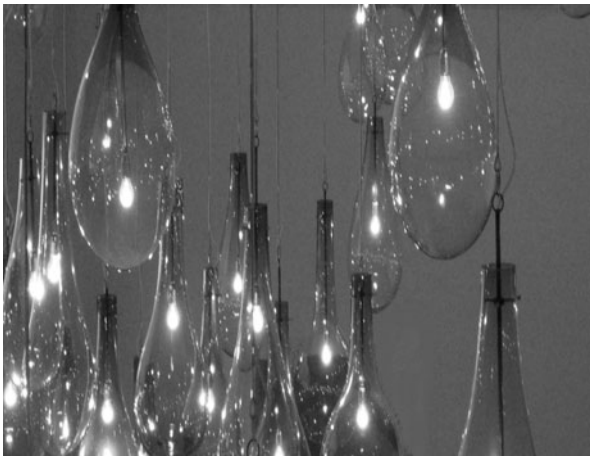
# Chapter 5
# Transdisciplinarity and New Paradigm Research

**Michael Biggs and Daniela Büchler**



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## 5.1 Setting the Scene

In 2007/2008 we undertook a survey of Swedish doctoral theses in architecture and urbanism. The purpose of this study was to investigate the role of architectural practice in academic research. The central question asked was whether academic research in areas of creative practice, such as architecture and urbanism, is in some way different from traditional models that are used in other academic disciplines. Although the results have been published (Büchler et al., 2009), they have not been discussed in terms of the transdisciplinary nature of academic research in architecture. In this chapter we take the opportunity to revisit the outcomes of this study in

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I. Doucet, N. Janssens (eds.), *Transdisciplinary Knowledge Production in Architecture and Urbanism*, Urban and Landscape Perspectives 11,
DOI 10.1007/978-94-007-0104-5_5, 

order to consider what they show us about the nature of transdisciplinarity in architectural research. We will use the Swedish Architecture Theses project as a backdrop against which we will consider architecture as a discipline, the role of practice in academic research, and the transdisciplinary character of architectural research.[1]

The aim of the Swedish Architecture Theses project was to enable a discussion of how architectural design practice contributed to academic research in the sample of theses compiled. The objective was to identify any cases of so-called practice-based research, also known in Sweden as arts-based or artistic research [*konstnärlig forskning*] (Biggs & Büchler, 2008b). Practice-based research is sometimes claimed to be unique to areas of creative practice and often the researchers themselves assert that the artefacts produced have an essential role in the research, and as a result, that it could not be conducted or communicated without these artefacts. The study therefore aimed to clarify the characteristics of this kind of practice-based approach in architectural research through the analysis of a sample of doctoral theses. In the process, a selection and mapping of this sample was conducted. A critical analysis of this mapping enabled the proposition of an ontology of academic research in which the role of practice in architectural research, and its possible practice-based elements, was clarified.

The project hypothesised that academic research containing practice-based elements may constitute a novel paradigm. In an earlier article we explained that the genealogy of these models was characterised as arising either out of "exploratory practice within the traditional model of academic research, [or] practice as a generator of relevant questions" (Biggs & Büchler, 2008a, p. 87). In our view, this describes a polarisation of two roles for practice: as explanation and as generation of knowledge. This view prompted the Swedish Architecture Theses project as a means of unpacking the consequences of the different roles for practice in academia. In this project, we aimed to identify the generic epistemological, ontological and methodological positions of research containing an element of creative practice through the observation of PhD studies that were produced in architecture and urbanism.

The central question was investigated through empirical and theoretical methods, and prompted a further three complementary questions. The structure of the empirical part of the project used the sample of architectural theses to identify cases where traditional research criteria satisfied, or did not satisfy, the needs that the researchers themselves identified as relevant to them. When cases were identified in which the traditional research criteria did seem to satisfy the needs, these cases were further analysed in terms of whether this agreement was due to the existence of shared concepts between the traditional model of academic research and architectural practice. When cases were identified in which the traditional research criteria did not seem to satisfy the needs, these cases were further analysed in terms of whether the inadequacies of the traditional models of academic research were due to the demands of architectural practice and the particular concepts that are adopted in these areas. Finally, a response to the central question could be made in terms of the relationship between worldviews and research paradigms (Biggs & Büchler, 2009) and in terms of the role of design practice in architectural research in academia (Büchler et al., 2009).

Initially, two searches were conducted in order to establish the sample and thereby map defining characteristics of Swedish academic research in architecture. The first search was conducted in November 2007 and selected Swedish theses in architecture using the keywords: "architecture/Arkitektur, theory/Teori, philosophy/Filosofi, art, department of architecture, department of architecture and town planning, arts based research". This search was conducted in the databases: Swedish National Library, Regina and Libris, KTH (Royal Institute of Technology), Stockholm University, LUP (Lund University Press), MUEP (Malmö University Electronic Publishing), Chans (Chalmers library catalogue). A total of 212 PhD theses were identified, and a further selection of these removed those that did not centrally address architecture and that did not have an online abstract in English. This resulted in 79 PhD theses that comprised the sample.

In order to enable a relevant mapping of the sample it was necessary to structure a provisional classification of models of academic research. This structuring stepped away from the particularities of the Swedish Architectural Theses project, and began to identify areas, disciplines and subjects that are adopted by research councils and universities in Sweden, the UK and Brazil. This range of countries was chosen due to the fact that the authors have each held academic appointments in these countries. Despite being convenient, such a heterogeneous mixture of national contexts, traditions and perspectives was also helpful in determining patterns of academic clustering of cultures of knowledge. We have previously claimed that "depending on how the matter is conceptualised, the distinction between PbR [practice-based research] and conventional academic research can go from visible and debatable to invisible and therefore not debated" (Biggs & Büchler, 2008a, p. 86). How one describes something suggests how one understands it and this impacts on how things are clustered. Certain academic communities adopted specific terminology to describe what they did and how they saw what other communities did. For example, in some communities, we found that the concept of research being "academic" is synonymous with it being "scientific". A critical reading of different community descriptions of academic research revealed that whilst the way in which the research activity is clustered can vary from one community to another, the fundamental understandings behind the clusters that emerged were broadly consistent.

## 5.2 Disciplines and Cultures of Knowledge

In the fields of cultural studies and activity theory, a community is defined as a group of individuals who share common values. A community has a shared set of values that define them and to which the members subscribe and thereby identify themselves as part of that community (Bourdieu, 1992). Values include cultural beliefs, and also epistemological beliefs about the nature of the world and how we can interact with it. When communities evolve naturally, these values reflect the community practices and these practices reflect the values. As a result, a community possesses an internal coherence between its values and the actions it performs. It is therefore apparent why each community does what it does given what it believes and values

(Engeström, Miettinen, & Punamäki, 1999). This situation introduces the possibility of there being a unique academic research paradigm for each unique community of values. Research paradigms hold models that structure and sustain the production of academic research according to that community's values. This is done through the academic conventions that determine certain activities as being relevant and acceptable, and therefore constitute that community's research model (Biggs & Büchler, 2010).

Research paradigms are all different but they all share something in common that makes them into an academic paradigm. We have identified these common characteristics as a set of four generic requirements that must be met by research in all disciplines (Biggs & Büchler, 2008b). The generic requirements consist of "question and answer", "method", "knowledge" and "audience". These can be construed as a network of interdependent concepts. Assuming that research is cumulative, one needs a question in order to provide an answer. The answer will add to our knowledge and to what is understood. The question will arise in a context for which there is an audience. This audience will judge whether the outcome is a satisfactory or relevant response to the question, and therefore whether they are any the wiser as a result of the research. The appropriateness of the answer to the question for the audience will be reflected in the use of methods that persuasively connect one to the other, and are used by the community who form the audience for the outcome (Biggs & Büchler, 2007). Thus we see that for a community, certain questions are relevant, certain actions are appropriate, and certain outcomes are satisfying and respond to their concerns. These communities constitute disciplines, but also share beliefs about what they are doing and therefore they all inhabit the same larger academic community. Discipline boundaries are defined by identifying communities of practice that share certain interests and concerns, and expressing it in this way brings to the fore the relationship of the community to its research and knowledge base (Wenger, 1999).

The understanding of what constitutes one discipline as opposed to another, and the boundaries that determine subject areas in academia, was revealed when we undertook a critical analysis of the different national contexts. We saw the organisation of national research funding agencies and the distribution of subjects within university departments as symptomatic of different views on how academic subjects are clustered. It was possible to identify in the academic community three emerging cultures of knowledge which could be perceived across national and institutional boundaries. This means that, although the cultures that we identified may not reflect the discipline genealogy in individual national contexts, owing to their fundamental conceptual similarities they are widely applicable. The clustering of disciplines is a matter of perspective. Indeed, the lack of a definitive classification of subjects within disciplines and departments was manifested in our own University when the school of art and design was recently reassigned – from the humanities to science and technology.

Each of the cultures of knowledge that we formed consisted of a community which shared a set of values and understandings of how the world was and how research should be conducted. In particular, members of each community found

similar questions meaningful, similar methods productive and similar outcomes satisfying. We named the cultures of knowledge: Humanities & Human [H&H], Applied & Social [A&S] and Natural & Technological [N&T]. Each culture of knowledge contained a family of mutually comprehensible values and actions. We subsequently found an alternative set of cultures of knowledge in the so-called Frascati Manual (OECD, 2002, p. 77), which we interpreted as reinforcing the general notion of organising disciplines into cultures of knowledge. Furthermore, because we wanted to adopt an approach to analysing the theses that would be as independent as possible of authorial claims and intentions, we preferred to group theses and activities in terms of cultures of knowledge so that the sample could be mapped independently of the subject area claimed for the research. This was relevant because architecture is regarded as a science in some institutions, and as art in others, for instance, and there are corresponding claims and concepts of identity on the part of the researchers.

We initially defined each culture of knowledge as follows: research in the culture of H&H explores theoretical, historical and philosophical aspects of issues through criticism and interpretation; research in the culture of A&S enhances knowledge of how society functions and how cultural values are developed and disseminated; and research in the culture of N&T we defined as that which typically explores materials and/or techniques through empirical methods that imply objectivity or disinterest on the part of the researcher. When observing the actual research that is conducted in architecture as represented in our sample, we were able to further refine these definitions with reference to one another and consider how architectural research fits in with these cultures of knowledge. This is in line with our position that subject boundaries are a matter of perspective and our core interest was in mapping all academic disciplines with a special focus on architecture.

From our sample, we found that studies in the H&H culture of knowledge dealt with conceptual and philosophical aspects of what, in A&S, would be dealt with either empirically or in terms of human impact. In this sense, to study what is "perceived" or "experienced" may be conducted either within A&S or H&H depending on whether it is considered broadly "objectively" or "subjectively". Even in the event of an analytical interpretation that, as a result of being undertaken by an individual would hold elements of subjectivity, in H&H these would be undertaken with focus on the object of study rather than on the reaction to or reception of it. The consideration of symbols and their interpretation can indicate H&H, while designing the symbol system would suggest an architectural practice position. For example, an urban signage system could be studied from an A&S perspective, i.e. considering the user reception, or from an H&H perspective, i.e. through a semiotic analysis. Within our sample of 79 theses, 11% could be classified as adopting the H&H research model exclusively in their studies. Meanwhile, 57% of all studies contained some H&H element – be that method, framework, approach, etc. – to varying degrees, in conjunction with elements from other cultures of knowledge.

In the culture of A&S, the methods that are used are typically those that value the personal and subjective judgements, either of the participant or of the researcher, i.e. opinions and observations that use subjective criteria or those that are participatory.

The act of "reflecting" on one's own work could be an indicator of A&S, in the case of there being a reflective participant for example. However, the presence of a so-called "reflective practitioner" is a characteristic of the architectural position. The investigation of the role of experience and creative processes would fall into the culture of A&S because these are human/social elements, while the concern with the process that arises from "insider" knowledge of practice would indicate the architectural practitioner position. The empirical consideration of emotion, experience, perception, all have meaning within the culture of A&S, while the philosophical investigation of these would indicate that this was a study that lies within the culture of H&H. In our sample, 7% of all studies adopted the A&S research model exclusively, and 62% of all studies used at least one element from the A&S culture of knowledge to different degrees.

In the culture of N&T, studies typically explored materials and/or techniques through empirical methods that imply objectivity or disinterest on the part of the researcher. The assumption is that results are analysed rather than interpreted, and therefore it is possible to produce subject-independent results that do not rely on personal interpretation, such as occurs during observation or description. For example, the development of tools can be N&T, especially when the tool itself is evaluative and can be objectified, or when it is used to verify feasibility and weaknesses, or when it aims to enhance quality. Tool development can also indicate the architectural practitioner position, especially when it contributes to practice or when the development of the tool itself is a part of the research, such as when an information visualisation system is created. Another example comes from a study of perception where the consideration of psychophysics and reaction to sense stimuli would indicate the culture of N&T, while a study within the A&S culture of knowledge might consider the subjective opinion on stimuli. Similarly, "interaction" could indicate an interest in the user's experience and therefore be A&S, however the term is most often used in connection to hypermedia and thus suggesting N&T. Likewise, words such as "impact", "quality" and "efficiency" may indicate objective parameters and measurements and therefore indicate N&T. In our sample, we found no studies that exclusively used N&T research models, however 45% of all studies used elements of the N&T research model to different degrees. Interestingly, 90% of all studies that had an N&T element also presented an architectural practice position in terms of its concerns, questions, aims, outputs, etc.

The analysis of the sample suggested that architectural research was produced either in one of the three cultures of knowledge, or where these overlapped. This observation led to the construction of Fig. 5.1, which represents the relationship between the cultures of knowledge and the place of architectural research in that schema. Therefore, in addition to the three cultures of knowledge that we initially formed, architectural research emerged as one further area that was identifiable as being produced using theories, methods and/or frameworks from them. Furthermore, architectural research presented an architectural practice perspective, either in terms of a central concern, the questions that were asked, the way in which it was conducted or the outputs that were sought. Architectural research is thus identifiable because it uses academic research models to consider architecture as a

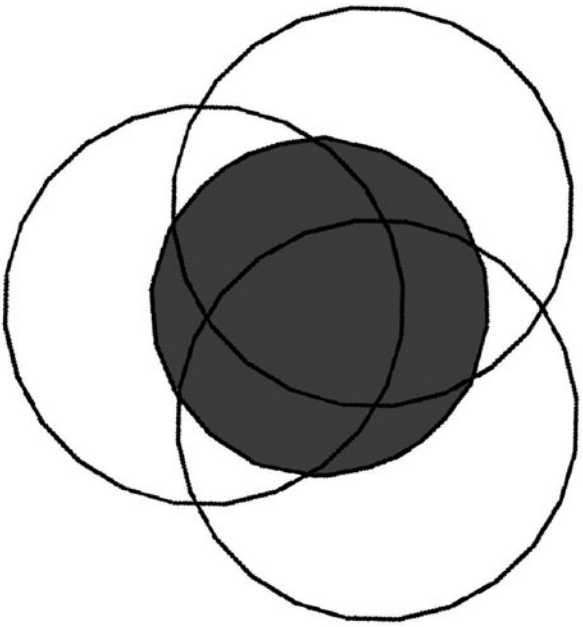

**Fig. 5.1** The three main cultures of knowledge in academic research and the position of architectural research

theme. In this sense, it is not defined by being undertaken by an architect-researcher but instead is defined by addressing the theme of architecture and responding to the values of academic research.

There is a close correspondence between the way the cultures of knowledge and the location of architectural research crosses boundaries and the definition of interdisciplinarity by Gibbons:

> Interdisciplinary is characterised by the explicit formulation of a uniform, discipline-transcending terminology or a common methodology. The form scientific cooperation takes consists in working on different themes, but within a common framework that is shared by the disciplines involved. (Gibbons et al., 1994, p. 29)

We found a common language across the three cultures of knowledge that brought them together as academic disciplines. We described this above as the generic set of four requirements for academic research. In addition, in the centre of Fig. 5.1, we found a set of concerns held by researchers that were interdisciplinary in the sense that they transcended and unified these disciplines. Researchers working in the architectural research discipline share common concerns that are related to the professional practice of architecture. As we have said, this shared concern from architectural practice is what constitutes architectural research as a discipline, and the act of transcending disciplines is what characterises it as interdisciplinary.

## 5.3 Architectural Practice and Architectural Research

It is often the claim of architect–researchers that one of the defining characteristics of architecture as a discipline is that it contains at its core an element of professional practice. However, research in any area has an element of professional practice in connection with its application. We call this "generic" practice. To represent the presence of generic practice in academic research, in Fig. 5.2 we have introduced a third dimension. This enables us to represent our claim that generic practice may occur in any of the three cultures of knowledge, and not only in the intersections that form architectural research. Figure 5.2 articulates the network of relationships between the cultures of knowledge and the presence of practice in academic research.

Research in any area often has an element of generic practice. However, the presence is unproblematic if the established model of research that is adopted accommodates it. For example, a researcher can use models from business disciplines in order to undertake a Post Occupancy Evaluation of a building. In this case, the practice of conducting the Evaluation is unproblematic within the research because the business disciplines offer established methods for it. This type of generic practice occurs in architectural research, sometimes within a single culture of knowledge or where the cultures overlap.

However, architectural research often possesses an element of "creative" practice as distinct from the unproblematic generic practice. Creative practice is produced in the professional context such as, in this case, in the architectural design office. This introduces the notion that the person undertaking the research will be the

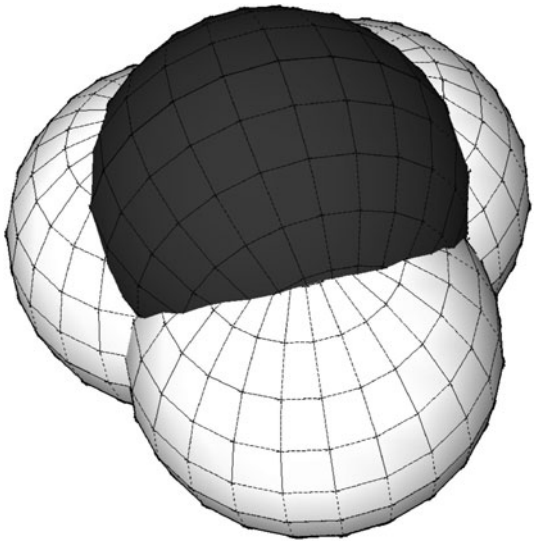

**Fig. 5.2** The academic research activity with the added dimension of practice

architect, who we will call the architect–researcher, in contrast to the academic-researcher who produces research with generic practice. The architect–researcher brings into the academy the skills of professional architectural design. For example, in a study in which the architect–researcher designs and constructs a new building and then proceeds to test post occupancy perceptions, there is an element of creative practice in the designing of the building itself. This creative practice is not accommodated in the research models that incorporate only generic practice. In our sample, individual research projects in architecture were found to use various structures, models, frameworks, methods, and so on, from the three cultures of knowledge to varying degrees. However, as distinct from studies "on" architecture that adopt established research models and incorporate generic practice, studies "in" architecture often contained an element of creative practice. We applied this distinction and thereby further refined the sample from 79 to 17 theses in which either the architect–researcher claimed to have used "creative practice-based approaches", or where we could identify an element of creative practice in the research.

Creative practice arises in architecture but is not accommodated by the models of research offered in the three cultures of knowledge. Indeed, we adopt a reductionist approach in defining creative practice as the kind of practice that is not so accommodated. In Fig. 5.3 we can see that when we add the dimension of generic practice into the representation of academic research, there is an area in the discipline of architecture that extends beyond the three cultures of knowledge. This area contains both generic and creative practice. Because this top dark grey area remains outside of the three cultures of knowledge, architect–researchers do not have direct access to established models of research. As a result, they cannot simply appropriate research models, at least not in the way that these models present themselves within their respective cultures of knowledge.

In order to design the actual building that the Post Occupancy Evaluation methods from business will evaluate, the architect–researcher will have to adopt methods from architectural design practice such as brief development and brainstorming techniques. These design activities do not form part of the academic research toolkit,

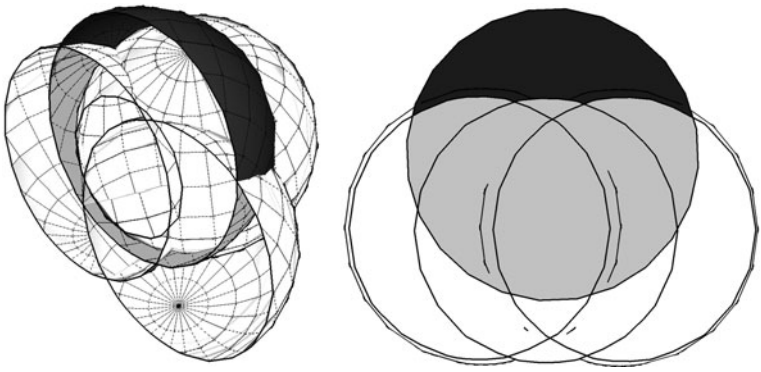

**Fig. 5.3** Generic and creative practice in academic research

whereas the Post Occupancy Evaluation methods do. Because creative practice is meaningful to the architectural community, the architect–researcher will attempt to involve their creative practice in the research in some way. We observed that this is done through the adoption of a few clear practice-based approaches.

Figure 5.3 shows that there is an area of academic research that is composed of the three cultures of knowledge and their established research models. Any generic practice that occurs within this area can be accommodated through use of the established models of research. However, in architectural research there is also an area that transcends this established academic area and that contains creative practice. Making a link between these two areas can be seen as possible or impossible, desirable or undesirable. Some architect–researchers hold the view that, although there are two distinct areas, the architect only inhabits the creative practice area and produces both practice and research in terms of that set of architectural community values. In this case making a link between one area and the other is undesirable and unnecessary for the production of academic research with creative practice.

When the areas are seen as distinct and making a link is seen as possible and desirable, it is necessary for the architect–researcher to adopt certain techniques for the inclusion of their creative practice in their research. These techniques are designed as a response to the assumption that certain practice-based approaches are necessary to ensure that the values and requirements of both communities are represented. Values and the consequent actions that are developed by either one of the communities are seen as something that should be upheld. When a link is made between these areas, it is because the researcher wishes to introduce what they value in order to transform the other community in some way.

Architect–researchers will borrow traditional elements of academic research and apply them to value-reflecting questions, or take their value-reflecting methods and attempt to modify them so as to make them more acceptable to the academic community. The research model that a community adopts reflects its value system and, consequently, impacts on the techniques that will enable those values to be represented in the model. This is an iterative relationship in which the community holds certain values, for example that the artefact is particularly instrumental to the effective representation of those values, and then proceeds to identify or design a research model that reflects this valuation of the artefact.

Practice-based approaches can be described in terms of whether the architect–researcher will preserve or transform element(s) from established academic models in order to produce research in areas in which there is no accepted research model. That which is chosen to be preserved indicates what is regarded as essential for each community – either for the production of academic research in any area or for the production of creative practice as defined by the professional community. That which is valued is being preserved, and should therefore remain untransformed. The element that is taken, when it is used in the new community, should impact that community either by using established academic models for validating the creative practice or by contributing creative practice towards the transformation of the

established academic models. Although architect–researchers will try various ways of ensuring that the value-reflecting activity is present in the research, we have identified three specific practice-based approaches, which serve to make a link between the interests of the two communities.

First, we identify the architect–researcher who transits between one community and another, and depending on which community they are in, take and use those community values completely. Second, the architect–researcher can take their own practices and values and use them in an academic context in an attempt to transform established academic practices so that what they value, i.e. creative practice, is recognised as academically valid without having to be transformed. The third practice-based approach is used by that architect–researcher who takes established academic models and uses them to transform their practice. By associating their practice to what is seen as being of value in the academic community, they attempt to validate elements of their, now, transformed practice.

If we unpack these three practice-based approaches, we find that in the first the architect–researcher adopts what we have termed a "Changing Hats" technique, meaning that this individual will alternate between wearing a practice hat and a researcher hat. When acting as a practitioner, the practice community values will be reflected in the actions, without being influenced by academic requirements. However, when it is time to conduct academic research and the researcher hat is on, the practice values are abandoned and the academic community values and activities are taken on. These individuals act intentionally, meaning that, when being a researcher, they intend that the work should be labelled as research and adopt activities that are socially recognisable as academic.

The second practice-based approach we have called "Reflective Practice". The architect–researcher who adopts this approach attempts to bring in that which is valued in the creative practice community, but in a variant that would be recognised in academia. For example, an architect–researcher that regarded the role of subjective experience as particularly valuable to the practice community could adopt reflective practice as an analytical method for making explicit the instrumentality of such experience (Schön, 1991). By making experience explicit, the architect–researcher is producing an academic outcome but has done so by introducing – from practice – an increment to established research methods from, in this case, behavioural psychology.

In the third practice-based approach, the architect–researcher attempts to validate practice by associating it with established models of academic research. We have called this "Academicised Practice". The established models are adopted to lend scholarship and credibility to the creative practice activities. For example, the architect–researcher's own work could be used as a case study which is then analysed through the use of established models so that it can be defended in scholarly terms. By using established academic models and thereby locating the creative practice in relation to established arguments and authorities in the academic area, the architect–researcher has attempted to make the practice more recognisable and accessible in academia.

## 5.4 Considering Architectural Research as Transdisciplinary

Up to this point, we have described our findings from the Swedish Architectural Theses project. We will now reconsider the project findings in a discussion on the character of architectural research. This will be done in terms of the definitions of transdisciplinarity offered by Häberli and by Gibbons, and in terms of our position on new paradigm research theory.

> The core idea of transdisciplinarity is different academic disciplines working jointly with practitioners to solve a real-world problem. It can be applied in a great variety of fields. (Häberli et al., 2001, p. 4)

In our sample, it could be observed that the different academic disciplines were indeed working jointly with one another to produce architectural research. Real-world problems and problem solving activities could also be observed being introduced from professional practice. One could construe that the "working jointly" was achieved by the practice-based approaches that served to make a link between the communities of architectural practice and academic research, and the use of these approaches indicated that the two communities remained distinct.

> Transdisciplinary research is an additional type within the spectrum of research and coexists with traditional monodisciplinary research. (Häberli et al., 2001, p. 4)

From the perspective offered by this part of the definition, one could see that the "spectrum of research" is impacted by the contribution from architectural professional practice. This additional dimension afforded by practice would bring with it the possibility for new types of research. Therefore, practice would add potential to research in all areas because it would broaden the range of questions that are meaningful, of techniques that are available and outcomes that are satisfying. This accords with our representation in Fig. 5.2 in which practice adds a dimension to all cultures of knowledge.

> The science system is the primary knowledge system in society. Transdisciplinarity is a way of increasing its unrealized intellectual potential and, ultimately, its effectiveness. (Häberli et al., 2001, p. 4)

We understand the term "science system" as *Wissenschaften* corresponding to academic knowledge. In our theoretical framework, the notion of "primary knowledge system" corresponds to the three cultures of knowledge and their established research models. We observed that professional practice impacted on architectural research through the use of practice-based approaches. From the perspective offered by this definition, that which is foregrounded is the bridging nature of the practice-based approaches and one could therefore infer that there are discipline boundaries that need to be bridged. It would, as a result, continue to be possible to identify the core values present in the interdisciplinary research, for example the values of N&T in contrast to the values of A&S. Owing to the academic values that the three cultures of knowledge shared, an effective synergy between the cultures of knowledge that facilitated interdisciplinary activity would be observable.

However, we also observed a strong divide between the interdisciplinary activities on the one hand, and the activities brought in from professional practice on the other. In order to facilitate cooperation between the practice activities and the academic activities, the practice-based approaches would be acting, in Häberli's construct, as bridging mechanisms. We would observe, for instance, that the second practice-based approach aimed to increment the established models of academic research by contributing their values and notions from creative practice. Furthermore, while the first and third practice-based approaches do not aim to impact the established models, architect–researchers who adopted these approaches would recognise these models as constituting the "primary knowledge system".

We can thus identify corroborating evidence of architectural research being transdisciplinary according to the definition offered by Häberli. This definition relies on a continuing differentiation of disciplinary boundaries, areas of interdisciplinarity and the contribution of professional practice. As a result, if the practice-based approaches are construed as bridging mechanisms, we find the definition of transdisciplinarity proposed by Häberli one that could be used to describe architectural research. However this emphasis on discipline boundaries is not to be found in all descriptions of transdisciplinarity.

> Transdisciplinarity arises only if research is based upon a common theoretical understanding and must be accompanied by a mutual interpenetration of disciplinary epistemologies. Cooperation in this case leads to a clustering of disciplinary rooted problem-solving and creates a transdisciplinary homogenised theory or model pool. (Gibbons et al., 1994, p. 29)

What we notice in Gibbons' definition is the use of the terms "interpenetration" and "homogenised". Both of these require the initial establishment of disciplinary boundaries, but in contrast to Häberli, it is followed by activities that have the effect of dissolving or rendering these boundaries invisible. When looking at our sample, one could construe that architect–researchers had effectively mobilised concepts and skills from more than one culture of knowledge and brought them to bear on a single architectural study. To this extent, their actions could be described as dissolving the former boundaries because the original location of the concepts in a particular culture of knowledge was not relevant to their use in this context.

In line with Gibbons' definition, there would be no need for bridging mechanisms because the boundaries that would have to be bridged have been dissolved and homogenised. In this case, the practice-based approaches should be regarded as compensatory strategies in which traditional research elements are borrowed and modified. Practice-based approaches would constitute isolated attempts at compensating for what architect–researchers perceive as the limitations of the existing models of research and their shortcomings. The practice-based approaches that Häberli would see positively as bridging mechanisms, Gibbons would see as remedial compensatory strategies that attempt to bypass the lack of a model of research for the new homogenised discipline. Nevertheless, both bridging mechanisms and compensatory strategies alike require that practice and research be regarded as separate. However, while the bridging mechanism attempts to augment the science system, the compensatory strategy is ultimately producing a translation, i.e. from

a format that is acceptable in professional practice to a format that is acceptable in academia.

In the definition offered by Häberli, when the science system is augmented through the introduction of practice, there may no longer be a distinction between the plane of interdisciplinary research and the third dimension of generic practice. This would mean transforming the methods and epistemologies of academic research so as to seamlessly integrate the concepts brought in by professional practice. There are two ways in which this could be understood: either as a stretching of what we already have or as a complete reconceptualisation of what each activity is contributing. This apparent dichotomy between the practice-based approaches serving as tools for the increment of the scientific model, or as strategies for compensating inherent short-comings in the scientific model, can be resolved if we take another definition of transdisciplinarity research offered by Gibbons:

> Transdisciplinarity: knowledge which emerges from a particular context of application with its own distinct theoretical structures, research methods and modes of practice but which may not be locatable on the prevailing disciplinary map. (Gibbons et al., 1994, p. 168)

There is a unified quality to this definition from the outset. In particular, there is no boundary between the concepts and the practices, neither are there boundaries between cultures of knowledge. Thus we see a difference between Gibbons' first definition, in which existing boundaries were homogenised, and Gibbons' second definition, in which a distinct culture of knowledge emerges with an integral harmony between its constituent parts.

## 5.5 Taking a New Perspective

If we focus on the pre-homogenisation need for disciplinary boundaries, then we can see how Gibbons is an increment on transdisciplinarity as described by Häberli. On the other hand, if we focus on the post-homogenisation lack of disciplinary boundaries, then we can see Gibbons, in this second formulation, as describing a distinct culture of knowledge. If we go one step further, rather than seeing a synthesis of disciplines as the result of a process of homogenisation, we might regard the initial condition as already being homogenous.

This leads to our perspective of there being a new paradigm, in which we can regard this initial homogeneous condition as indicative of a distinct culture of knowledge. This distinct culture of knowledge would have arisen authentically from the values of the community by mobilising meaningful activities from the outset. By authentic we mean that the actions are recognised as meaningful by that community, that they address research questions that are topical and result in outcomes that have a significant impact on those problems for that community. When one looks at Fig. 5.3, one can see that the dark grey top of the architectural research sphere projects beyond the three cultures of knowledge. Rather than seeing this as a problematic area that needs to be incorporated into established cultures of knowledge

through transdisciplinary means, we see the tip of a new architectural culture of knowledge, which still lacks a specific research model.

This research model should emerge from a coherent relationship with the worldview of the architectural community. The research model will be authentic to the extent to which it is faithful to the values of the architectural community. For this architectural research model to be recognised as a form of academic research, it is necessary to satisfy both the community of architectural practice and the community of academic research. This could be compared to the problem faced by the development of qualitative methodology in the 1980s, which opened the door for a number of so-called "new paradigms" (Guba & Lincoln, 2005). Within the framework of new paradigm research, we see the potential for describing architectural research as a particular culture of knowledge.

> In our opinion, any given paradigm represents simply the most informed and sophisticated view that its proponents have been able to define, given the way they have chosen to respond to the three defining questions. (Guba & Lincoln, 2005, p. 108)

In this quote, Guba and Lincoln introduce the notion of there being different paradigms of inquiry operating simultaneously in accordance with each individual community's worldview. This corresponds very closely to our three-dimensional representation in which each culture of knowledge contains the full range of academic activity including theory building, practical experimentation, and so forth, which is coherent with its worldview. The diversity of disciplines within the academy is shown by the intersection of these three cultures of knowledge resulting in interdisciplinary subjects such as architecture.

Guba and Lincoln also suggest that the response that a community gives to the "three questions", i.e. the ontological, the epistemological and the methodological, defines shared understandings of how the world is. The research models that are in line with those shared understandings will therefore satisfy that community. This explains the coherence between values and research models within disciplines.

We anticipate that architecture has a unique response to these three questions that identifies its potential for having a distinctive worldview. However, this worldview and its consequences, including why actions such as architectural practice have a certain role and, what it is that creative practice contributes, all need to be unpacked explicitly. When this is done, the points of commonality with other forms of academic research can be identified, the architectural culture of knowledge can be located, and appropriate research models developed.

**Acknowledgments** The authors would like to acknowledge the financial support of the Swedish Institute (SE) and the Arts and Humanities Research Council (UK) for funding the research.

## Notes

1. See http://r2p.herts.ac.uk/ardp/stheses.html. Accessed March 2010.

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# Chapter 6
# Building (Trans)Disciplinary Architectural Research – Introducing Mode 1 and Mode 2 to Design Practitioners

**Halina Dunin-Woyseth and Fredrik Nilsson**

Workshop in explorative architectural design research at Chalmers School of Architecture, Göteborg, Sweden. Photo © Chalmers School of Architecture

## 6.1 Preamble

The objective of this chapter is to discuss Mode 1 and Mode 2 knowledge production through the lenses of the authors' educational practice at the doctoral level, conducted in Scandinavia and Belgium. Our audience has been primarily prospective or already enrolled PhD students recruited from the practice of architecture, design

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I. Doucet, N. Janssens (eds.), *Transdisciplinary Knowledge Production in Architecture and Urbanism*, Urban and Landscape Perspectives 11,
DOI 10.1007/978-94-007-0104-5_6, 

and arts. The text will present our own conceptualisation of the complex issues of knowledge production and it should be considered as a contribution to research education for practitioners, rather than to the issues of Mode 1 and 2 per se.

This chapter is based on a series of lectures with ensuing seminars, which we as tutors offered at various academic institutions during the period 2003–2009. These lectures have explored the potential of transdisciplinarity and Mode 2 knowledge production for practitioners in various design professions. During those years we received valuable feedback from our audience of PhD students and prospective students, which helped us to revise the content and form of the lectures. The lectures have been focused on several complex issues concerning various existing "knowledge landscapes" as well as on the more recent developments with regard to the emerging new modes of knowledge production. The aim of these lectures and seminars has been to present some aspects of the development of research within architecture and urban design as a field of practice and inquiry, and to help the prospective or novice PhD students to position better their own research within these "knowledge landscapes" (Dunin-Woyseth, 2009a; Dunin-Woyseth & Nilsson, 2009b).

The lectures have attempted to grasp the meta-level issues of the new mode of knowledge production and the opportunities it brings with regard to design research. They have consisted of two parts, the first of which introduced the development of architectural research mainly in the Scandinavian countries together with the essential features of Mode 1 and Mode 2 (Dunin-Woyseth, 2009), and a second part, which related these features to contemporary architectural and design theory, and various practices in architecture and urban planning (Nilsson, 2004, 2007). In this chapter these aspects are intertwined into a presentation primarily consisting of three diachronic parts. The first part discusses how doctoral dissertations by practitioners have developed in the Scandinavian countries from the early 1970s until approximately the beginning of the 1990s. The middle part, starting from the period between the early 1990s and continuing until around the first 5 years of this century, presents the development of "doctoral scholarship" in the same geographical region. The third part is devoted to recent international developments in new modes of knowledge production and suggests several possible ways how design-related knowledge can become an important contributor to the new "knowledge landscapes". This part is related to the authors' experiences in research education in Belgium.

As the "scaffold" for constructing this chapter, the authors propose, firstly, to discuss the Scandinavian and Belgian[1] development of the doctoral scholarship in architecture, and secondly, the international debates that constituted the backcloth of this development regarding the three major modes of knowledge production: monodisciplinarity, interdisciplinarity, and transdisciplinarity.

> Interdisciplinary research can be considered as a means to share disciplinary knowledge in order to create new concepts and theories, create a product, or solve specific problems. In contrast, transdisciplinary contributions involve a fusion of disciplinary knowledge with the know-how of lay-people that creates a new hybrid that is different from any specific constituent part. Trandisciplinarity is not a process that follows automatically from the bringing together of people from different disciplines or professions, but requires an ingredient

> that some have called 'transcendence'. It also implies the giving up of sovereignty over knowledge, the generation of new insight and knowledge by collaboration, and the capacity to consider the know-how of professionals and lay-people on equal terms. Collectively, transdisciplinary contributions enable the cross-fertilization of ideas and knowledge from different contributors, they can lead to an enlarged vision of a subject as well as new explanatory theories (Formas, 2006, p. 42).

The main corpus of the chapter, consisting of the three diachronically organised parts, builds upon four components: (i) a brief description of the development of the doctoral scholarship in Scandinavia during a given period, (ii) some issues concerning contemporary architectural and design theory, and various practices in architecture and urban planning, which relate to the period in question; (iii) an inference from both, i.e. (i) and (ii), and, (iv) a diagram, which further illuminates the inference in a visual mode. The rationales that back the construction of the diagrams have been discussed elsewhere (Dunin-Woyseth & Nilsson, 2008; Dunin-Woyseth, 2009).

## 6.2 "Patchwork Quilts" of Knowledges and Doctoral Scholarship in Architecture and Design

### *6.2.1 The Mid-1970s Until the Beginning of the 1990s*

Before this period, during a "preparatory phase" of doctoral research until the mid-seventies, PhD students derived their subject of research from their professional or pedagogical practice. The motivation to take a doctoral degree was most often to conclude a professional career by reflecting on one's professional interests. The doctoral students carried out their research in the framework of an individual arrangement with their supervisors, most of whom were not scholars, but highly esteemed practitioners. The doctoral theses represented a kind of professionally internal discussion with the subject matter, and the attempts to engage in an academic dialogue with the traditional knowledge disciplines were few and far between. The language of these theses was most often that of informed professionals, not that of scholars seeking broader academic communication.

For the pedagogical purpose of simplifying we may identify architecture and its practice with the profession of architecture. This makes it possible to regard it as an autonomous field, where professions are identified with "certain characteristics that differentiate the professions from specialised vocations in general; the most important being the professionals' claim of autonomy within a field" (Burns, 2000, p. 262). It has also been argued that "most professionals are consumed by establishing boundaries around themselves that determine who can legitimately engage in a particular craft" (Sutton, 2000, p. 205). Similarly, academic disciplines are here regarded as autonomous fields where "disciplines are defined by groups of objects, methods, their corpus of propositions considered to be true, the interplay of rules and definitions, of techniques and tools" (Foucault, 1972, p. 222). Every discipline tries to group ideas and knowledge in certain ways, and various combinations of alignments form the separate disciplines. The specificity of each assemblage forming a


**Fig. 6.1** The "preparatory/first phase" in developing doctoral scholarship in architecture and design (until the mid-1970s) in Scandinavia. In this and in the following diagrams, the *lower part* represents the level of professional architectural practices, the *upper part* represents the level of academia with "clouds" of disciplines. The *arrows* show the interaction and communication, which sometimes are non-existing or weak and therefore marked with a cross

discipline is reached through the theories used. "What determines and maintains any alignment, what gives it its singularity and delimits its boundaries, what assists in adjudicating its decisions, is its *theory*" (Johnson, 1994, p. 2).

The relations between architectural doctoral scholarship and the world of academic disciplines in this preparatory period can be described by the well-known metaphor of "a badly made patchwork quilt" even if a more known metaphor for such relations is "knowledge landscapes" (Becher & Trowler, 2001, p. 29). The "patches" of established *monodisciplines* functioned autonomously in their academic world, while architectural practice and its scholarship created another "patch" of closed universes, that of *profession-based fields* (Fig. 6.1).

In the middle of the 1970s, the schools of architecture in the Nordic countries were pressured by their national authorities to develop a more academic profile, i.e. a more research-oriented one. For architectural vocational studies such a demand was a serious challenge as there was no strong tradition for this aspect of the field. The schools and faculties of architecture began to look for more strategic and institutionalised ways in their effort to build up such an academically oriented profile. Some theoretical disciplines, especially the social sciences and humanities, offered models to follow. This period, until the beginning of the 1990s, we called the "second phase" in the development of doctoral scholarship in architecture.

Architectural and urban design practice was in relation to research mostly regarded as a sort of "applied science". As a consequence of this, PhD students were expected to "renounce" their professional backgrounds as designers and architects. In the doctoral theses of this period it is difficult to trace any awareness of a scholarly stance from their authors. Consequently, the "dialogue" between architectural research and various academic disciplines, addressed in order to discuss architectural matters, lacked on the part of architecture any awareness of its own intellectual identity. There were but few examples of the newly acquired doctoral knowledge and insight being applied in professional practice. Most often, doctoral

research in architecture and design could be regarded as bleak imitations of humanistic, social and technological research. That model of doctoral work seems not to have addressed important questions like: What is unique about design knowledge? Does the concept of design knowledge as "an applied science" allow for adequate theoretical and epistemological foundations for design thinking? Do such questions also concern other professional disciplines?

During this period the discussions on post-modernism as well as post-structuralism were highly influential on the development of architectural theory. The critique of modernism opened up to a lot of other fields, and the theoretical debate brought in influences from several disciplines, e.g. sociology, psychology, history, and in the 1980s not least philosophy (See Nesbitt, 1996; Hays, 1998). The advanced conceptual developments were at this time in many cases based in disciplines outside of architecture itself.

Criticism of adopting methodologies "from the outside", firstly from the social sciences and then from the humanities, by the architectural scholars, was clearly expressed by some informed practitioners at the end of the 1990s (Burns, 2000, p. 266). In the Scandinavian context, architectural research was criticised for having taken over theories and methods from other disciplines without reflecting on the specific character of the architectural field (Lundequist, 1999, p. 7). Social sciences were influential on architectural research, but they primarily can describe what "is", necessarily presented as "seen as". It can contribute with certain types of knowledge, but it is never complete with regard to what is addressed by architecture and its practice (Mo, 2001, p. 93). The explorative, future-oriented aspects of constructing unseen possibilities through design are not addressed or elaborated through these scientific approaches, and support for developing important parts of the discipline is missing. "Our job is to give the client, on time and on cost, not what he wants, but what he never dreamed he wanted; and when he gets it, he recognizes it as something he wanted all the time" (Skjønsberg, 1996, p. 49). To look forward and construct the future is a central part of architectural design. What humanistic studies have in common is "an interest in history, in the reading of texts, in interpretation (also of art), and in hermeneutics, which is seen as a tradition, philosophy, form of scholarship, and research method all in one" (Mo, 2001, p. 97). People in various disciplines think that architecture is "just" an application of the kind of academic study that they themselves are doing. But "architecture [. . .] cannot be seen as a trivialised art form, an aestheticised engineering practice, or a dressed-up sociology. Other disciplines can give perspectives on it, but never capture the entirety" (Björn Linn cited in Mo, 2001, p. 131).

Looking at this period in architectural doctoral scholarship in the Nordic countries and at the issues mentioned above concerning the contemporary architectural theoretical debate, one could, using again the metaphor of a "patchwork quilt", notice the development of new "seams" that are apparent but not yet strong enough. They were too weak to keep together the *field of architecture*, characterised earlier by its closeness between practice and inquiry. Architecture was too weak in its intellectual independence to keep together with the well established "patches" of the academic *monodisciplines*. This "new" doctoral scholarship lost its professional

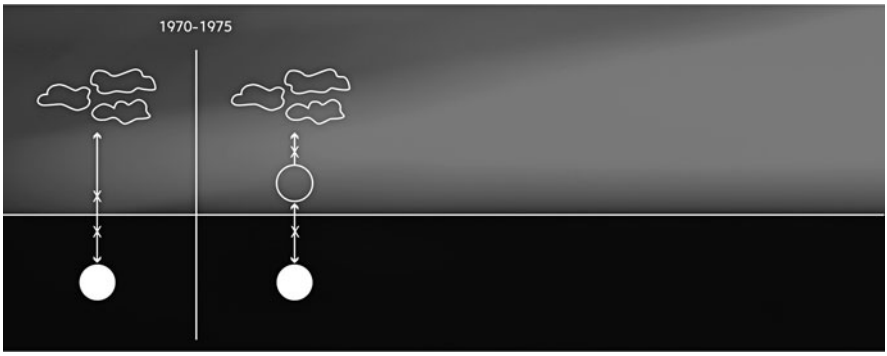


**Fig. 6.2** The "second phase" in developing doctoral scholarship in architecture and design in Scandinavia

relevance, but at the same time it did not manage to develop an equal scholarly position to interact in an *interdisciplinary context* with the academic monodisciplines (Fig. 6.2).

### *6.2.2 The 1990s and the Turn of the Millennium*

A discussion about the desirability of a more architecturally pronounced epistemological stance began at several Scandinavian schools of architecture early in the 1990s. The new university laws in Scandinavia, which demanded a more academically professional model of scholarship (including doctoral programmes with organised research education) from all institutions of higher education with university status, provided a direct incentive for this discussion. This period we dubbed "the third phase" in the development of the doctoral scholarship in architecture.

In March of 1992, a Nordic network for co-operation in research education for design professionals was established. Their members represented several Scandinavian schools of architecture offering professional training within design, architecture and spatial planning, which were called in this milieu "the *making* professions". These schools were in the process of establishing their doctoral programmes based on mandatory research education. There was a strong need to discuss issues at a broader level than national contexts, possible contents, and methods of research education in the fields of *making* knowledge. The Network continued to co-operate, and organised a series of Nordic courses in research education, sponsored by the Nordic Academy of Advanced Study (Nordisk Forskerakademi). These courses contributed to the "third phase" in the development of doctoral studies where the focus was on establishing the identity of design thinking (Dunin-Woyseth, 2002, pp. 7–18).

During this "third phase" several attempts were made to answer questions like the following: Is it possible to find unity in the diversity of our approaches to design and design research? How do artefacts come into existence? What are these artefacts

and what are their properties? What are the outcomes of artefacts in the individual and collective lives of human beings?

The challenge of developing architectural and design scholarship has been to comply with the demands of the two worlds: on the one hand, with the world of its own profession, and, on the other, to abide by the rules of the academic world. While the main criterion of viability in the former world is its relevance to the practice of the professions, in the latter it is its ability to fulfil the criteria of scholarship. In the United States, a debate from the 1990s around architecture as a discipline was presented in the publication "The Discipline of Architecture" (Piotrowski & Robinson, 2000). One of the contributors, Stanford Anderson, recognised there both the profession and the discipline of architecture. They are two realms of activity which "intersect" each other; they are partially but not wholly coincident. What the author means by the "discipline of architecture" is a collective body of knowledge that is unique to architecture and, though it grows over time, is not delimited in time or space (Anderson, 2000, pp. 292–294). A Scandinavian concept of the *making disciplines* has been an attempt to formulate a kind of quality supportive framework for *making* discourse rather than of a sensu stricto traditional discipline (Dunin-Woyseth & Michl, 2001). It has been an attempt to respond to both the criteria of professional relevance and, not least, to that of a qualified dialogue with academia.

Developments during the 1990s in architectural and urban theory showed a growing number of notions of architecture that went from the static to the dynamic, where architecture was in a close dialogue with other disciplines. These changes in notions were in a context where the societal role of architecture was being discussed; a society influenced by global networks of economy and production described by change, elusiveness and flows, where borders are blurring and vast urban landscapes are emerging. Concepts such as "inclusive fields of organized materialization" (Zellner, 1999) and "field conditions" were frequently used to summarise an interest that is concerned both with broader socio-political contexts and the local conditions that govern the materialisation of architecture (Allen, 1997). Sanford Kwinter argued at this time for an architecture no longer marked by the usual devotion to objects, but instead becoming an organon, a means to gain knowledge, a system of inquiry, innovation and technique (Kwinter, 1998).

But how can we define the knowledge specific to architecture as a discipline? Francis Duffy delineates two specific characteristics of architectural knowledge: Firstly, it is unusually combinatory and complex, linking many disparate elements since architecture is such a large, complex and value-laden field. Secondly, architectural knowledge is concerned with the deontic rather than the descriptive – things as they ought to be, rather than things as they are (Duffy & Hutton, 1998; See also Simon, 1981 [1969]). Architectural design as a practice of formation, of material organisation, of giving form to elusive and contradictory forces in the specific project has the capacity to produce various kinds of knowledge (Nilsson, 2007). As Peter Downton writes: "Once in the world of things and ideas, a design can be seen as a repository of knowledge and interrogated to reveal the knowledge its designers have both intentionally and unintentionally embodied there." (Downton, 2003,

p. 107) The realised material – or immaterial – form could inform us about the diagrammatic conditions and governing forces producing them (Nilsson, 2004).

In these epistemological, as well as ontological, stances it is important not to conflate the notion of "form" with that of "object". The problems of form are, according to Kwinter, rather about the mechanisms of *formation*, about processes in which discernible patterns are emerging out of a less finely-ordered field. Design may offer methods that diagram the proliferation of fundamental resonances between the form of the object (or the form of expression) and the form of the content that produces the object, which could give the possibility for "a pragmatic description of historical emergence (why this object, institution or configuration here, in this place, at this time, and not that?)" (Kwinter, 2003, p. 97). At the same time, there was a growing discussion on the relation between the human and non-human worlds; how we are influenced by and are forming alliances with the artefacts produced in society, with consequences for culture as well as for science (Latour, 1993).

Around the turn of the millennium there was a renewed and intensified discussion about the specific traits of architectural research, and the international architectural theory debate was focused on architectural practice and its relation to research (Lootsma, 1999; Nieuwenhuis & Ouwerkerk, 2000; Sigler & van Toorn, 2003). Architects and offices like Stefano Boeri, OMA, Raoul Bunschoten, MVRDV, Foreign Office Architects presented their work as research and used methods that appeared to be systematic investigations of contemporary societies and cities[2] (Maas, Rijs, & Koek, 1998; Hensel & Verebes, 1999; Bunschoten, Hoshino, & Binet, 2001; FOA, Ferré, & Kubo, 2003). These projects as well as those set up at Harvard, Berlage, and ETH Studio Basel tried to understand recent changes in urban environments. Bart Lootsma has pointed out that it seemed an enormous change in relation to the period in which architecture withdrew to the "boudoir", focusing on linguistic games and emphasising its disciplinary autonomy. But Lootsma states that the research seemed to be largely ahistorical. "Current research focuses on the "new", on changes that seem to unsettle the discipline." The research within contemporary architecture fits into different research traditions employed by previous architects, not least those of the early modern movement (Lootsma, 2001, pp. 6–9).

Within these discussions on research, Alejandro Zaera-Polo emphasised the importance of exploring architecture-specific knowledge. Contemporary research is, according to him, directed to fields of knowledge that are either supra-disciplinary (economics, sociology, philosophy) or sub-disciplinary (engineering, construction management). The possibility of producing knowledge able to effectively analyse and articulate at both levels is a niche to exploit, and architecture as a discipline involving many others has potentials in doing so through research engaged directly in processes of transformation of the built environment (Arets & Zaera-Polo, 2003, p. 21).

As with architectural practices like FOA, MVRDV, Chora, and UN Studio, the use of architectural tools and imagination – now complemented by new technology – increasingly has become a means to analyse the complexity of contemporary society and to explore the relations between disparate things in urban contexts (Nilsson,

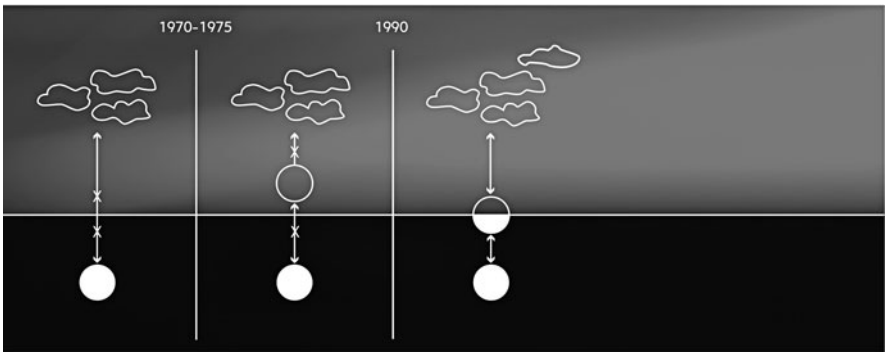


**Fig. 6.3** The "third phase" in developing doctoral scholarship in architecture and design

2004, 2007). Architecture as a discipline constitutes a field where highly different kinds of knowledge amalgamate. Its professional skills consist of abilities, on the one hand, to interpret through rational reasoning, and on the other, to discover unexpected potentials by experimental shaping and designing. The potential for using this in research became more and more evident at the beginning of the new millennium, with possible benefits for both academia and professional practice.

The "third phase" of the doctoral scholarship at various schools of architecture in Scandinavia can be again discussed in the terms of the metaphor of a "patchwork quilt", as can the issues in contemporary architectural debate, as introduced above. The most important feature of this period was a growing awareness of the potential of designerly ways of thinking as a prospective, equal in status, contributor to knowledge production, one in accord with both the ontological and the epistemological premises of new developments in the world. A more critical use of the theoretical and methodological frameworks of the established *academic disciplines* in architecture-derived research projects resulted in the production of doctoral works at the level of more mature *interdisciplinary* research. New intellectual self-confidence was to be observed in numerous doctoral theses from that period. The "seams" between design scholarship and the discipline-based academic knowledge have been strengthened. Research into new ways of conducting research, based on activity specific to the field, was encouraged in architecture academia. "Patches" of field-specific architectural scholarship began to emerge in the "quilt" of forms of knowledge (Fig. 6.3).

### *6.2.3 Mode 1 and Mode 2 of Knowledge Production with Regard to Architectural and Design Scholarship*

In the Nordic countries, the network for co-operation in research education held the professionalism of research education as its aim (Dunin-Woyseth & Nielsen, 2004). Between the years 1999–2001, the network organised a Scandinavian research education programme called the Millennium Programme in which more than 50 Nordic

PhD students participated. At the conclusion of the programme, the network's teachers agreed that the current status of research education offered adequate training opportunities for the growing Nordic community of architectural and design researchers. However, this seemed to apply mainly to traditional disciplinary and interdisciplinary academically-initiated research. The network teachers decided that the next phase of co-operation should be committed to the preparation of young researchers to meet the demands for new types of a broader research competence in problem-solving research. A new Nordic pilot study course, sponsored by the Nordic Academy of Advanced Study, was arranged in 2003. Its intention was to introduce the Nordic doctoral students to the international discussion on new modes of knowledge production. Since the Nordic course on Mode 1 and Mode 2 in 2003, the issue of new modes of knowledge production has been addressed in research education at the Oslo School of Architecture and Design, at the department of Architecture at Chalmers University of Technology in Göteborg, at the Sint-Lucas School of Architecture in Brussels, and through the individual doctoral projects of the PhD students.

While the development of the doctoral scholarship in architecture and design was in the previous periods induced by the Nordic national university laws, thus prompting the establishment of organised research education in this geographic region, the Bologna-Berlin guidelines of 2003 extended such development to a broader European context. The intentions of the European guidelines seem to stimulate doctoral research more towards Mode 2 than towards Mode 1 knowledge production (Bologna-Berlin Communiqué, 2008).

For some years now, the term "transdisciplinarity" has been spreading around the world, appearing in different discussions and places, and giving rise to new insights, conceptualisations and perplexity. According to the theoretical physicist Basarab Nicolescu, a characteristic of transdisciplinary approaches is the quest for a deeper understanding of our present world, together with a palpable orientation towards the future. The connection to design thinking is obvious. The term transdisciplinarity first appeared four decades ago and was coined to give expression to a need for transgressing disciplinary boundaries. Up until some years ago, however, the term was virtually unknown, and it is still confused with two other relatively recent terms, multidisciplinarity and interdisciplinarity (Nicolescu, 2002). Multidisciplinarity relates to studying a research topic not just "through the lenses" of one discipline but of several disciplines at the same time. Interdisciplinarity concerns the transfer of methods from one discipline to another. Like multidisciplinarity, interdisciplinarity overrides the disciplines, but its goal still remains within the academic framework of disciplinary research, as is the case with multidisciplinarity. In contrast, transdisciplinarity concerns that which is at once between the disciplines, across the different disciplines, and beyond all disciplines. Its goal is the understanding of the present world. Disciplinary research concerns, at most, one level of reality – or, in most cases, only fragments of one level – but transdisciplinarity relates to the dynamics engendered by the action of several levels of reality at once. To see and make use of these dynamics, it is necessary to master disciplinary knowledge; transdisciplinarity is nourished by disciplinary research, and from this,

disciplinary and transdisciplinary research should not be seen as antagonistic, but rather as complementary (Nicolescu, 2002, pp. 44–45).

It was through the now canonical work "The New Production of Knowledge" by Michael Gibbons and five other leading knowledge scientists that the notion of transdisciplinarity became widely spread in relation to the description of two parallel and competitive modes of knowledge production. "Mode 1: The complex of ideas, methods, values and norms that has grown up to control the diffusion of the Newtonian model of science to more and more fields of inquiry and ensure its compliance with what is considered sound scientific practice. Mode 2: Knowledge production carried out in the *context of application* and marked by its: *transdisciplinarity*; *heterogeneity*; organisational hierarchy and transience; social accountability and *reflexivity*; and quality control, which emphasises context and use-dependence. Results from the parallel expansion of knowledge producers and users in society" (Gibbons et al., 1994, p. 167).

The definition of Mode 2 introduced the notion of transdisciplinarity, described in the following way: "Transdisciplinarity is a new form of learning and problem solving involving cooperation among different parts of society and academia in order to meet the complex challenges of society. Transdisciplinary research starts from tangible, real-world problems. Solutions are devised in collaboration with multiple stakeholders. A practice-oriented approach, transdisciplinarity is not confined to a closed circle of scientific experts, professional journals and academic departments where knowledge is produced. [. . .] Through mutual learning, the knowledge of all participants is enhanced, including local knowledge, scientific knowledge and the knowledges of concerned industries, businesses, and non-governmental organizations (NGO's). The sum of this knowledge will be greater than the knowledge of any single partner. In the process, the bias of each perspective will also be minimized" (Thompson Klein et al., 2001, p. 7).

The protagonists of transdisciplinary research maintain that in spite of its growing importance and extent it does not replace the traditional forms of research, such as disciplinary research. Even if it is competing, it is still an additional form of research that involves partners from outside academia (Häberli et al., 2001, p. 8). The founders of the Mode 1/Mode 2 movement maintain that in order to master the tasks of Mode 2, one has to get through an apprenticeship in Mode 1. One has first to develop a kind of intellectual identity of Mode 1 in order to be able to acquire multiple cognitive and social identities for practising research in Mode 2 (Gibbons et al., 1994, pp. 148–150).

Transdisciplinarity and Mode 2 have appealed to the design scholars as a new "in-practice model" of research that has great similarities with design. This mode opens for various ways in which the design professions could contribute to knowledge production. Bryan Lawson even states that it is possible that architects and designers unknowingly "are just ahead of the game rather than behind it after all" (Lawson, 2002, p. 114).

In the middle of the first decade of the new millennium, the concept of transdisciplinarity has begun to be discussed within international architectural theory (See Stanek & Kaminer, 2007). It can be seen as connected to the focus of previous years

on architectural practice and discipline, and its relation to research. Within the architectural debate, Zaera-Polo launched a critique on advanced academic architectural research, which to a large extent had its focus on philosophy, sociology, literature, and cultural studies, and which had not succeeded in defining a system of assessment internal to the discipline of architecture. "Often this has resulted in some of the most advanced research in architecture looking like bad movies, bad sociology, or bad literature" (Zaera-Polo, 2005, p. 4).

The concept of transdisciplinarity was also placed in relation to the call for a stronger discipline of architecture, and Mark Linder argued that it is also related to debates on interdisciplinarity and theory. Here transdisciplinarity offers a view that is distinct from pervasive notions of interdisciplinarity. It understands the combination of various disciplines as a means to establish shared methods or concepts, while simultaneously insisting on the value of distinctly disciplinary identities, tools, techniques and technologies. According to Linder, transdisciplinary work can be seen as navigating a contested field of discourses that has been claimed and structured by different disciplines, and those discourses are constantly being reconfigured as they are shared by, or interact with, various disciplines. Transdisciplinary work is demonstrating the flexibility of disciplinary identities, and the negotiations between disciplines produce reconfigured modes of practice. "Because it continues to use properly disciplinary techniques, concepts, and vocabularies and, at the same time, is open to the alterations that emerge when they make undisciplined appearances or appear in altered forms in other disciplines, transdisciplinary architectural work, whether by architects or others, will both intensify and expand the discipline" (Linder, 2005, p. 15).

In 1997, Christopher Frayling led a group that presented the seminal report *Practice-Based Doctorates in the Creative and Performing Arts and Design*. Here it is argued that the development of research methods in the social sciences and humanities, as well as in the more eclectic approaches now adopted within traditional science, has led to a situation where a substantial amount of research, though not practice-based, does not conform to a narrow (and probably mythical) definition of a traditional "scientific" model of research. It is no longer possible to polarise research efforts as either conforming or not conforming to the "scientific method", which previously was the guarantor of "real research". "There is already a continuum from scientific research to creative practice" (Frayling et al., 1997, p. 15).

The authors have investigated through their research educational work at the Sint-Lucas School of Architecture in Brussels and Ghent how this relevance and potential could be true in the context of doctoral scholarship in architecture and design (Dunin-Woyseth & Nilsson, 2006, 2008, 2009b). Through our various studies of ongoing doctoral projects at that institution we explored how transdisciplinary approaches could be used in research within the creative professions of architecture and design. We noticed that it could involve various degrees of transdisciplinarity, which includes the use of disciplinary, interdisciplinary and transdisciplinary components in the research design of doctoral projects, as well as of the designerly components per se. Several projects tend to apply more academic approaches of interdisciplinarity (practice-disciplinary knowledge - practice), while others adopt

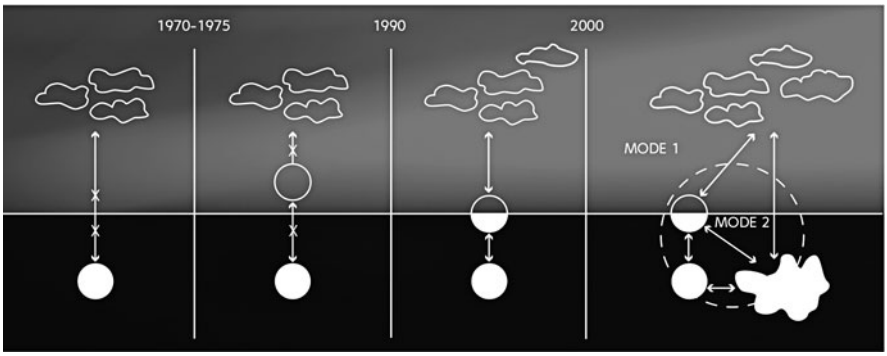


**Fig. 6.4** The recent developments in doctoral scholarship in architecture and design (beginning in the new decade)

more practice-internal modus operandi (practice to practice) (cf. Janssens, 2009; Godts, 2009). Yet, they all can be discussed in terms of transdisciplinarity as they include forms of knowledge other than from academic disciplines, and their interest is anchored in their creative professions.

The developments in our practice of research education for practitioners in architecture and design both in Scandinavia and in Belgium, as well as the developments in the "meta-debates" on new knowledge production seem to complement each other. The "patchwork quilt" metaphor allows the consideration of these developments in several ways. It provides for a more abundant richness of the various kinds of "architecture patches", on the one hand, and on the other, strengthens the "seams" between these "patches" and the world of the disciplinary and interdisciplinary knowledge in an equal dialogue. It also opens the way to strengthening "autonomous patches" of architecture where transdisciplinary research is conducted within the practice of architecture, without input from the epistemological world of the academic disciplines (Fig. 6.4).

## 6.3 Mode 1 and/or Mode 2 for Future Doctoral Scholarship in Architecture and Design?

The belief in the relevance and potential of transdisciplinary research as the main concept for doctoral scholarship in profession-based doctorates has been realised in various doctoral programmes in United Kingdom, Australia and New Zealand (Davies & Rolfe, 2009). Some scholars even maintain that: "Doctoral Mode 2 knowledge generation is a key consideration in professional doctorate study" (Sparrow, 2009, p. 5). There are even inquiries conducted on how university departments may need to reorient their doctoral training programmes to prepare students for Mode 2 knowledge production (Bruun, Langlais, Rask, & Toppinen, 2005).

Yet, the authors agree with the protagonists of Mode 2 who maintain that, in spite of its growing importance and extent, Mode 2 does not replace the traditional

forms of research, such as disciplinary research. Even if it is competing, it is still an additional form of research that involves partners from outside academia where it is, as the founders of the Mode 1/Mode 2 movement maintain, important to develop a kind of intellectual identity of Mode 1 in order to be able to acquire multiple cognitive and social identities for practising research and communicating findings in different contexts. The authors regard "research by design" as a form of post-academic science, and as such, its prospective practitioners should be introduced to the principles of traditional research as applied to their own field, but they should also be trained in some transferable and generic research skills which are common to Mode 1.

While discussing various scenarios for doctoral scholarship in architecture and design we find promising the approach to research formulated by Johan Verbeke when he was rector of the Sint-Lucas School of Architecture in Brussels and Ghent. In 2006, he wrote that his institution should give a central position to a syncretic and integrated approach to research, where it would be possible to continue traditional Mode 1-related inquiries to architecture, but that it should have a special emphasis on strengthening design-based, practice-embedded research (Verbeke, 2008, pp. 12–13). The latter has features of Mode 2-related explorations, as opposed to traditional architectural inquiry, based in various academic Mode 1 disciplines.

Let us make a tentative exercise in diagram formation. If we place scientific research and creative practice as two poles of tension on a continuous horizontal axis, and disciplinary and transdisciplinary research as two poles of the vertical axis, we get a field or matrix in which we can position and "map" different research approaches. We would argue that research related to architectural practice moves in the area where creative practice and transdisciplinarity overlap, even though a lot of efforts are involved in more scientific and disciplinary approaches. In its relatively short history, architectural research has attempted many times to move the field towards scientific research and disciplinarity (Fig. 6.5).

Knowledge production in the area around transdisciplinarity and creative practice has been seen earlier as being completely outside of research and scholarship. However, during the last decade we have experienced an ongoing discussion, an interest even from the scientific world, which has made it possible to start conceptualising the knowledge field of design and architecture in new ways. A more inclusive model of research is currently developing where more practice-based approaches are possible, and it is on the way to achieving academic recognition as well as gaining the vital interest of the practitioners.

But there are still important questions to be addressed, conceptual developments to be formulated, and arguments to be legitimised for the specific knowledge field of architecture and design. We must still find better ways to take care of and utilise the knowledge produced in architectural practice, as it constitutes the core of architectural knowledge. In any case, we are now better prepared to start exploring the present world with other methods, approaches and even "hunches", thus not leaving Mode 1, but expanding design scholarship to embrace the promises of Mode 2.

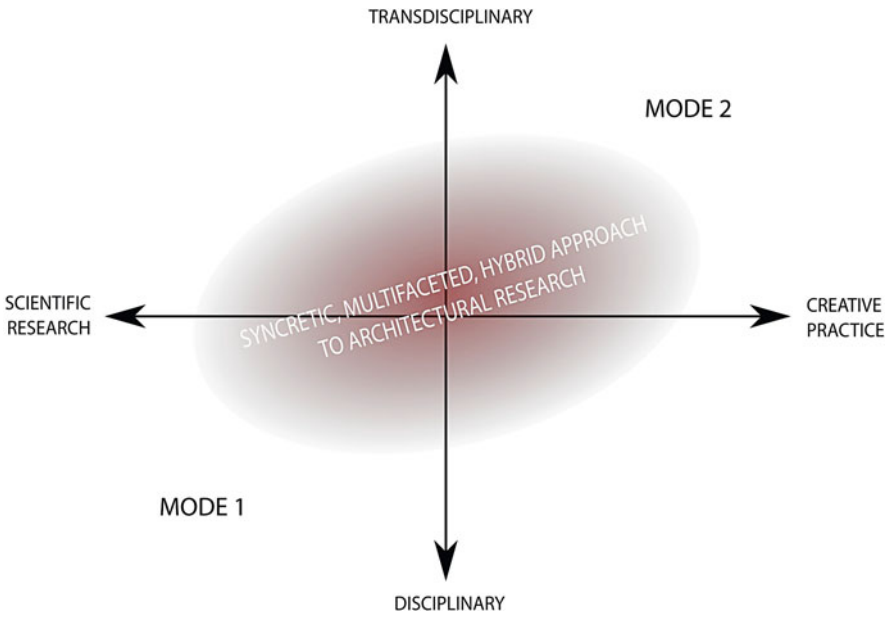


**Fig. 6.5** Expanding architectural research with syncretic, multifaceted, hybrid approaches within the field of dialogues between Mode 1 and Mode 2 of knowledge production

**Acknowledgments** This chapter builds upon and draws from numerous publications of each of the authors and on texts which they have co-authored over the years. We would like to thank doctoral students and participants at seminars and workshops for valuable feedback. Special thanks to Dr. Monika Hestad, Associated Lector, Central Saint Martin, London, for the graphic design of our diagrams 1–4.

## Notes

1. The Belgian developments are described from the perspective of the Sint-Lucas School of Architecture Brussels-Ghent, which we have followed closely since 2005 and not least as professors 2007–2009.
2. Abbreviations are frequently used for the names of architectural offices, and those referred to here are Office of Metropolitan Architecture (OMA), Foreign Office Architects (FOA), MVRDV (Maas, van Rijs & de Vries) and United Network Studio (UN Studio).

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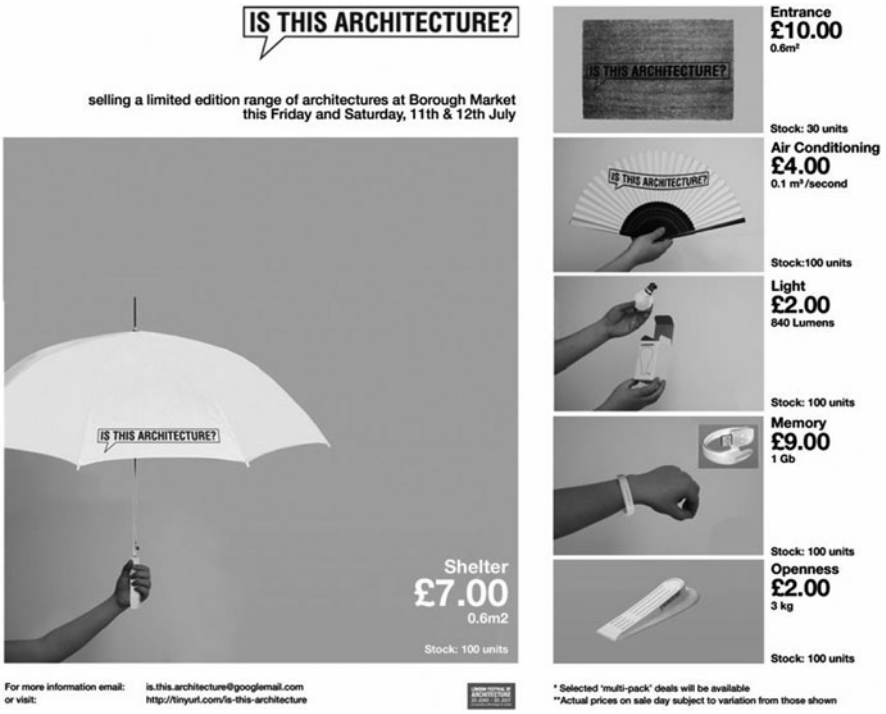
# Chapter 7
# Discard an Axiom

**Tatjana Schneider**




Architects for Sale. Students of the MArch Design Studio SoftPraxis set themselves the challenge of selling architecture and ended up selling its consequences on a stall in Borough Market in London in 2008: Umbrella – Shelter, USB Stick – Memory, Light Bulb – Light, Doormat – Entrance, Fan – Air Conditioning, Doorstop – Openness. [Copyright: SoftPraxis and The University of Sheffield]

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I. Doucet, N. Janssens (eds.), *Transdisciplinary Knowledge Production in Architecture and Urbanism*, Urban and Landscape Perspectives 11,
DOI 10.1007/978-94-007-0104-5_7, © Springer Science+Business Media B.V. 2011

*Prelude.* If the goal of transdisciplinarity is, as Basarab Nicolescu puts it, the "UNDERSTANDING OF THE PRESENT WORLD, OF WHICH ONE OF THE IMPERATIVES IS THE UNITY OF KNOWLEDGE" (2002, p. 260) and that transdisciplinarity, according to Roderick Lawrence, implies "A FUSION OF DISCIPLINARY KNOWLEDGE WITH THE KNOW-HOW OF LAY-PEOPLE THAT CREATES A NEW HYBRID WHICH IS DIFFERENT FROM ANY SPECIFIC CONSTITUENT PART" (2004, p. 489), what are the implications for architecture where, as Magali Sarfatti Larson observed, more often than not, lay-people "ARE NOT ENTITLED TO PARTICIPATE IN THE PRODUCTION OF THE PROFESSION AS A DISCIPLINE" (1993, p. 5).

To limit this discussion to practice on the one side and theory on the other, however, would be to miss the point. Transdisciplinarity, as it is understood here, moves beyond these two terms of binary opposition to include all the *stuff* that is central to architecture as a field of operation, as spatial practice. Yet, transdisciplinarity is not an easy thing to comprehend, instigate or put into action and brings with it a whole series of issues and problems concerning agency, power, as well as structure.

What follows here is one manifestation of the issues and problems transdisciplinarity confronts and is confronted with within the context of architecture. They purposely appear as fragments to illustrate quite literally the multi-facetted nature of different ways of doing: teaching approaches, ideology and architectural thinking, the organisation and expectancies of the profession as well as teaching and design methodologies. Personal opinions are intermingled with non-contextualised notes from a series of design studios or instructions given to students; interviews are fused with theories and teaching; "I" is mixed with the voices of others each of which is expressed in a different style – the voices of students (underlined text), *of teaching and writing collaborators* (italic text) as well as those of "EXPERTS" (capital letters) – to be used as a reference guide throughout the text. The format, as a result (and despite its artificial construct), is a direct reflection on both the possibilities of a transdisciplinary approach as well as on what I would see as the transdisciplinarity impasse.

The use of fragments as a method to display these varying themes not in a linear and unfettered sequence, but in a rhizomatous and interconnected yet non-continuous manner, reflects my personal approach to architecture as a relation of incidents or stories that are linked through themes, interests, and motivations rather than a continuation of space or time.

*Games of Chance.* The idea for this use of fragments as a structure came from a card from Brian Eno and Peter Schmidt's *Oblique Strategies*, which told me to "Discard an Axiom". I took axiom to mean a well-established principle, rule or law, and decided that the axiom I wanted to discard was the standard academic text and instead wanted to assemble an array of non-hierarchical positions and influences. Therefore, I followed the instruction, suspended disbelief, not quite knowing what exactly it might mean or where it might lead me.

I began to compile ideas, notes, as well as talk to people about how to draw out the problem and struggle with transdisciplinarity until it became clear that this,

precisely, was a representation of how different themes work together in their own inherent complexity. Soon it was not just this particular card that I followed or the initial instruction, but more both Eno and Schmidt's intention behind the game.

Brian Eno explains (in Taylor, 1997):

[. . .] THE PANIC OF THE SITUATION - PARTICULARLY IN STUDIOS - TENDED TO MAKE ME QUICKLY FORGET THAT THERE WERE OTHER WAYS OF WORKING AND THAT THERE WERE TANGENTIAL WAYS OF ATTACKING PROBLEMS THAT WERE IN MANY SENSES MORE INTERESTING THAN THE DIRECT HEAD-ON APPROACH. [. . .] THE FUNCTION OF THE OBLIQUE STRATEGIES WAS, INITIALLY, TO SERVE AS A SERIES OF PROMPTS WHICH SAID, 'DON'T FORGET THAT YOU COULD ADOPT 'THIS' ATTITUDE', OR 'DON'T FORGET YOU COULD ADOPT 'THAT' ATTITUDE'.

The game here is not an end in itself but a tactic for setting in motion a different way of thinking and doing to allow an element of digression, of open-endedness, of chance into a process that is habitually dictated and controlled by skill.

*Proposition. Suppose that normative methods of architectural education lead to certain values and methods being established in practice but also that different means of practice will develop different spatial possibilities. But: what are the conditions of such pedagogy? What are the challenges for architectural practice?* (Schneider & Till, 2007c)

*Architecture = Object.* Suppose first that architecture is not what we have been told it is, that it is about a lot more than just the placing of objects in space. Yet, by concentrating on the polished presentation of completed spaces, architecture has shuffled itself into a state of almost complete irrelevance. The problem with reducing the architect to someone who merely designs or conceptually develops buildings is that work and projects are determined by externally set parameters.

Now, suppose architecture was not about problem solving but about problem posing in Paulo Freire's sense (Freire, 1970). Yet, architectural education still perpetuates the notion of the expert. In year after year of architectural education, students are educated into believing that only they might hold the answers to specific problems. They are trained to exhibit this position to the outside: being authoritative when all authority does is alienate, playing the expert when it would be more helpful to ask questions.

Architecture needs to be understood as an embedded and deeply dependent part of this world, as working within a complex web of social relations. Henri Lefebvre writes that if we fail to pay attention to those relations, "KNOWLEDGE MISSES ITS TARGET; OUR UNDERSTANDING IS REDUCED TO A CONFIRMATION OF THE UNDEFINED AND INDEFINABLE MULTIPLICITY OF THINGS, AND GETS LOST IN CLASSIFICATIONS, DESCRIPTIONS AND SEGMENTATIONS" (1991, p. 81).

If architects do not acknowledge and work with the multitude of relationships between non-humans and humans, theoretical and practical, knowledge that was learned in the first place becomes irrelevant. At the same time it is important to admit the existence of different kinds of knowledge. To not only acknowledge these different positions and points of view but also to actively work with them means that education needs to address this current inward focus. As Lima de Freitas, Edgar Morin and Basarab Nicolescu state as part of the Charter of Transdisciplinarity "AUTHENTIC EDUCATION CANNOT VALUE ABSTRACTION OVER OTHER FORMS OF KNOWLEDGE. IT MUST TEACH CONTEXTUAL, CONCRETE AND GLOBAL APPROACHES. TRANSDISCIPLINARY EDUCATION REVALUES THE ROLE OF INTUITION, IMAGINATION, SENSIBILITY AND THE BODY IN THE TRANSMISSION OF KNOWLEDGE" (1994).

*Soft and Hard.* Whilst seemingly crude to start with, the terms soft and hard identify several tensions in the field of architecture: between indeterminate and determinate approaches; between the possibility for users to adapt space according to their needs and the designer determining use over time; between flexibility in the hands of the users and the provision of flexibility, only on the architect's terms; between designing in redundancy and slack space and tight-fit functionalism.

The natural tendency of architects is towards the hard, because it is in the realm of the determinate that one maintains a sense of control. Soft use, on the other hand, passes control over to the user, allowing them to appropriate the space as they see fit. The architect, if indeed there is one, here plays the role of facilitator rather than determiner or, in Zygmunt Bauman's terms acts as interpreter rather than legislator (1987).

This spirit is analagous to the sensibility that Jonathan Raban develops in his book Soft City: "THE CITY GOES SOFT; IT AWAITS THE IMPRINT OF AN IDENTITY. FOR BETTER OR WORSE, IT INVITES YOU TO REMAKE IT, TO CONSOLIDATE IT INTO A SHAPE YOU CAN LIVE IN" (1974, p. 12). The potential for others to imprint an identity is paramount in any building, but most of all in housing, where there is an ethical imperative to allow the dwellers to live out their own lives and not that of the architect.

To design a building with the specific intent for it to be changed in any way is to accept that the building is in the first place in some way incomplete, or even imperfect. This is of course counter to normal architectural values, which privilege completion and perfection. In addition, to admit to social flexibility is to admit time into our buildings, and architects, as Karsten Harries notes, live in the "TERROR OF TIME" (1982, p. 65).

Against this I advocate an architectural approach that is at the same time more modest and more canny because only then can one fulfil Raban's vision:

WE SHALL NEED MORE DARING, MORE COOL, UNDERSTANDING THAN THAT WE ARE DISPLAYING AT PRESENT. WE LIVE IN OUR CITIES BADLY; WE HAVE BUILT THEM IN CULPABLE INNOCENCE

AND NOW FRET HELPLESSLY IN A SYNTHETIC WILDERNESS OF OUR OWN CONSTRUCTION. WE NEED — MORE URGENTLY THAN ARCHITECTURAL UTOPIAS, INGENIOUS TRAFFIC SYSTEMS, OR ECOLOGICAL PROGRAMMES — TO COMPREHEND THE NATURE OF CITIZENSHIP, TO MAKE A SERIOUS IMAGINATIVE ASSESSMENT OF THAT SPECIAL RELATIONSHIP BETWEEN THE SELF AND THE CITY, ITS UNIQUE PLASTICITY, ITS PRIVACY AND FREEDOM. (1974, p. 3)

Thoughts on soft and hard were first developed together with Jeremy Till as part of a research project on the design of flexible housing (Schneider & Till, 2007b) and tested as part of two design studios, SoftSpace and SoftPraxis, which were based on the assumption that *softness*, that culpable innocence, social friction and mess could be a good thing.

*On Teaching.* I have never taught on my own. I have always collaborated with others. Since being at the School of Architecture in Sheffield, I collaborated with Jeremy Till on the design studios SoftSpace and SoftPraxis, and with Cristina Cerulli on design studios that have investigated the production of housing.

*On Finding Soft Space.* The design studio SoftSpace attempted to understand the present world through tools and mechanisms not usually applied to architectural projects.[1] Asked to *find* instances of SoftSpace, Jeremy Till and I gave each student a "site" of 2 km in length which had been generated at random: we had thrown Mikado sticks onto a map of Sheffield in a deliberate effort to get away from the "typical" site for an architectural project. We told the students that with their explorations of soft space they had to stay physically as close as possible to this line. Yet, digression and detours became unavoidable since each line produced from the projection of the Mikado stick crossed rivers, cut through buildings, went through the backyards of private dwellings and traversed public buildings (Fig. 7.1).

Anna Holder, a student of this design studio, writes that the subsequent representations of this found space focused on the way "spaces are used [and] the disjunction between people and built form".[2] Students started to understand boundaries as negotiable and often fuzzy (simply because the initial line did not have a specific boundary), encounters with the everyday became inescapable (simply because these random sites crossed areas the students were and were not familiar with), and the experience of a space posited a challenge to their learned knowledge (simply because it was outside their "normal" approach as problem solvers). The task of "finding" soft space propelled the students into the territory of the everyday where the voices of those they encountered became as important as their own. They found instances of space that were open to a more variable understanding and (re)interpretation; space that was open to changing conditions; and space that allowed choice.

As a result of these observations *out there* and *in the world*, the students produced a catalogue of SoftSpace that presented itself as a list, in no particular order, of the issues and problems encountered along each line.

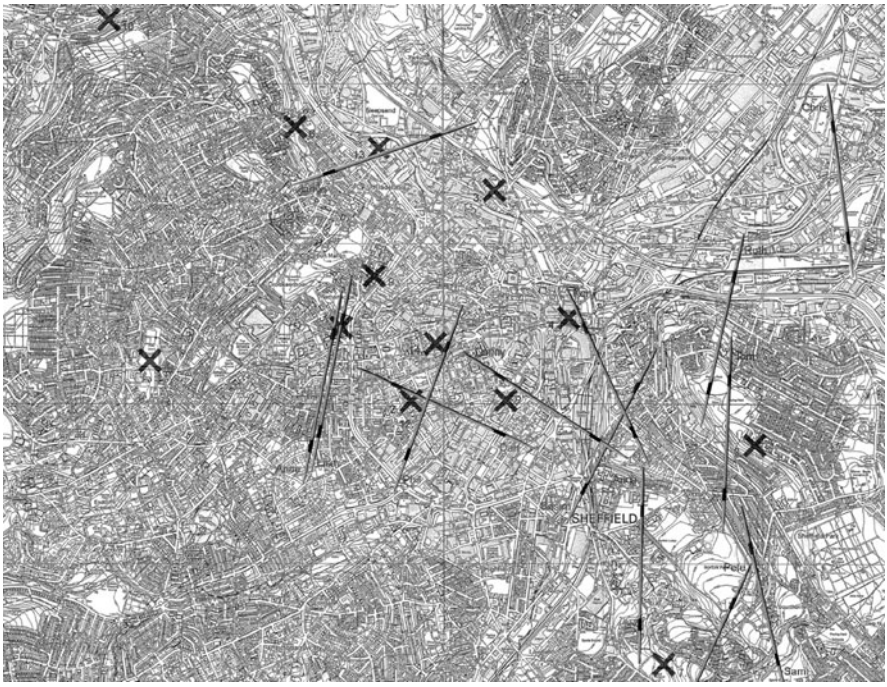


**Fig. 7.1** Mikado sticks thrown onto a map of Sheffield to generate a "site". [Copyright: SoftSpace and The University of Sheffield]

SoftSpace, they write, has to do with:

Codes/ signs / Enclosure/ exposure defined physically / Places in transition between public / private ownership / Order(less) -> rubbish / (anti) surveillance /Humanising elements / The non-physical (sound, activity, smell, light) / The background frame / Accessibility / Self-expression / Sustaining over time /Multi-layered approaches / Intensity / Time (past, future use, permanence, day to day change) / Movement - freedom / Permeability / Hybrid use[3]

In subsequent studies and spatial proposals for architectural interventions, elements from this catalogue of SoftSpace were used as tools to oppose what we saw as modernity's overwhelming will to order, functional and technical determinism, ungiving determinism that provided neither true dialogue nor true choice. In this opposition we were joined by Michel Serres, who in a conversation with Bruno Latour exclaims that "THE GENTLE LASTS LONGER THAN THE HARD" (Serres & Latour, 1995, p. III), as well as by Jean Renaudie's call for the experience of "PLEASURE IN SPACE [and for giving] EVERYONE THE POSSIBILITY TO EXPRESS THAT WHICH IS NOT DETERMINED, BUT WHICH REMAINS LATENT VIS-à-VIS THE USE OF SPACE" (quoted in Scalbert, 2004, p. 40).

*On Teaching.* I work in a School of Architecture. I teach design and a lot of people ask me whether I am a practicing architect. I also teach history and theory though nobody ever asks me whether I am a practicing historian or theorist. I teach, though nobody ever asks me whether I have any teaching qualifications.

*On Rules.* Rules, guidelines, recommendations, regulations and laws govern architecture. There are internal rules about who is allowed to call him/herself an architect, rules that determine how to work as an architect, regulations about how form and plans are produced and other guidelines and laws about which use is and is not allowed in a certain space. And there are external rules to do with architecture as product, investment and object of value. Rules are commonly seen as restrictive and limiting, but what would happen if we were to see this plethora of *don't*s as the ground for experimentation and imagination?

Writing about rules as one of the elements of SoftSpace, Anna Holder observes:

> Who makes the rules of Softspace, and who enforces them? My early feelings in distinguishing soft and hard space concerned ideas about what one could or couldn't do in a space; from explicit rules to the pervasive feeling of being watched, overlooked [. . .]. Can these architectural rules be seen as the rules of a game: encouraging action, suggesting possibility? Can the built environment, inside and outside, present a loose structure that encourages moments of intensity, of event, as well as serving the purposes of quotidian activity. (2006, p. 11).

Rules, if understood through Anna Holder's lens, can work against these socially produced processes of specialisation and compartmentalisation. Instead, her suggestions for rules cross the boundaries of knowledge. The suggestions are still governed by rules yet propose conceptual possibilities and generate instrumental knowledge.

*Delight.* NO ONE SHOULD BE INTERESTED IN THE DESIGN OF BRIDGES – THEY SHOULD BE CONCERNED WITH HOW TO GET TO THE OTHER SIDE.[4] (Price, 1984, p. 51)

*Tension.* Architecture is usually considered as a noun, but what if it has been a verb all along? Our love for architectural objects has allowed us to be distracted from questioning what "to architecture" might mean. Why shouldn't we cross some of the hard, boring lines that define how architects think, what architects design, how, why and for whom? What is architecture worth? [see title image of this[5] chapter]

What indeed would it mean if architecture was a verb? Why does it seem so impossible to rethink and redefine architecture for it to become a field of questions, rather than a self-protecting problem solving discipline? And yet: What is the problem with loving and designing architectural objects? Why should we not have more star architects designing ever more iconic buildings?

The problem, for me, lies here: for most people the term architecture equals building. To say that one is an architect means that one designs buildings.

Most architects are incredibly adamant that their one special skill is that of design. They are "experts" in designing. When this is said, however, design almost exclusively links to aesthetics – the spatial arrangement of plans as well as a building's external envelope. It is this perfect picture of the aesthetic and external that becomes the permanent record and point of reference for the rest of the world (or at least those that are interested in architecture).

Once a building is finished, just prior to inhabitation, it is photographed. A building's pristine, untouched state is frozen in time and the image of this is printed in the outlets of the architectural world: magazines, newspapers, and journals. It is this perfected image that we keep coming back to again and again. Nobody wants to see paint peeling off (because it has been applied too quickly), buildings obsolete after only a few years of occupancy (because the plans are unchangeable), rubbish bins in the street (because no storage place was designed), or simply because all the intentions of a building scheme (it was meant to be lively. . .; vibrant. . .; a street. . .; a place for children to play. . .) on a second visit, had not been met.

Architects are afraid to face the mess. Apart from a few exceptions, architects do not return to their buildings once they are finished. The trouble is that a building is always only a moment in time. Handing a building over to a client does not mean the process finishes here, or that the responsibility for it stops (Fig. 7.2).

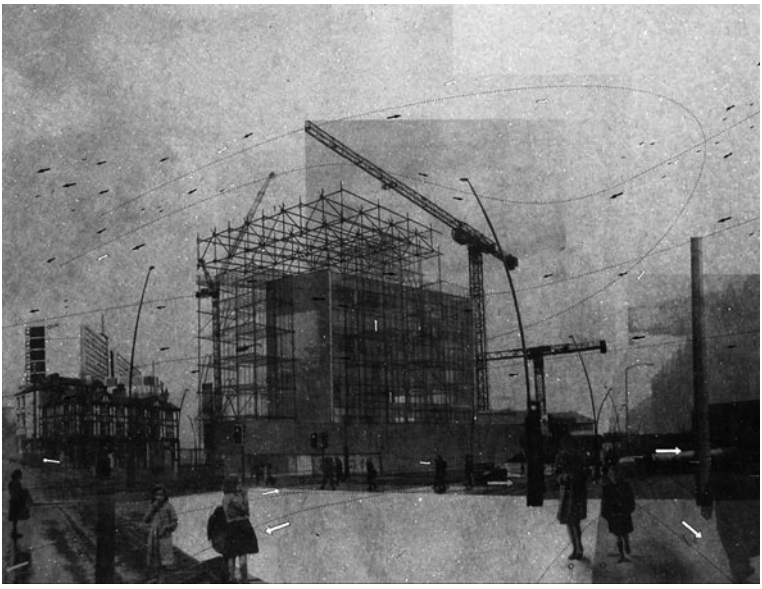

**Fig. 7.2** Joe Mackey, Grey Areas, MArch Design Studio project. The drawing portrays traces of use, time and uncertainty. It was drawn on brown card to symbolise the impossibility of a tabula rasa condition. [Copyright: Joe Mackey and The University of Sheffield]

In the words of Giancarlo de Carlo:

THE QUESTION WAS HOW TO MAKE AN ARCHITECTURE WHICH CAN INTRINSICALLY BE PARTICIPATED, AND THIS QUESTION OF LANGUAGE. HOW CAN THE LANGUAGE BE SUCH THAT IT FAVOURS AND PUSHES PARTICIPATION? I THINK THAT THIS QUESTION STILL HAS TO BE EXPLORED, IN MANY DIFFERENT FIELDS: SO I BELIEVE THAT THE CRUCIAL ISSUE IS TO USE LANGUAGE THAT PEOPLE CAN UNDERSTAND, PENETRATE AND EVENTUALLY USE. SO THE PROCESS IN MY OPINION TAKES A LOT LONGER TO FORM. PARTICIPATION IS SOMETHING THAT YOU SHOULD START – AND THIS IS SOMETHING THAT YOU SHOULD NOT FORGET - IT LASTS FOREVER. (Quoted in Obrist, 2006, p. 18)

*The Internal View of the Architect.* In Britain, the path to becoming an architect is divided into three stages. Part 1 and Part 2 are an integral component of the architectural education at the universities, and the final stage, Part 3, is completed whilst already in practice. To gain Part 1 and Part 2, students have to demonstrate – through "ACADEMIC PORTFOLIOS", which focus on architectural projects – that they have an awareness, knowledge, and understanding of architectural history and theory, analysis and research, human well-being, cultural contexts, wider global issues, and so forth. Part 3, which can be taken after a year or two in practice in the form of an exam, is concerned specifically with work experience. The criteria for Part 3 neither relate to design or culture nor to the social environment any longer. Instead, the criteria focus on the context for practice, the management of architecture, the management of construction, and practice management and business administration.[6]

It seems bizarre that students, often confined to the inside of buildings and not able to work on real life projects during their education need to demonstrate an understanding of the wider world, whereas once in practice, when these things could really be tested they are simply not deemed relevant any longer.

Life as an architect, as perpetuated in the "Criteria for Validation" as published by the Royal Institute of British Architects, is no longer about criticality – in every aspect of the process of design – but about adherence to law and best practice – in terms of management. In fact, Part 3 defines the incredibly restricted set of current professional concerns. Is it not about time to work on a critical evaluation of these criteria and propose a different measure for qualification as an architect?

*The Framing of Practice.* Educators might have little influence on "professional" codes as set out by the Architects Registration Board or RIBA. Clearly practice is framed by a much more complex set of cultural and political conditions than can be dealt with by a revised educational system alone. Yet, many of the restrictive values by which architecture protects itself from the brute realities of the political and social context are first formulated in architectural education, which equips students with a critical set of values and ethics as well as another idea of practice. To unravel

those values, one has to pay attention to a critical pedagogy (in Paulo Freire's sense of the term).[7]

*SoftPraxis.* While much architecture education is conducted behind closed doors, with only selected and polished outputs allowed out, Jeremy Till and I used a blog to expose the process of a design studio. We published everything: briefs, instructions, comments, thoughts, tutorials, reviews and notes from meetings.[8]

The topic of this studio was SoftPraxis (and followed SoftSpace) and it was set up to challenge established ways of working as well as patriarchal values, and sought alternatives to this informed by feminist and political principles of integration and the other.[9] However, we started with a "Hard Sell": students were given a brief for a competition to culminate in a formal presentation to a real panel of judges. Each student, as Jeremy and I instructed via the blog, was to work individually (without communicating to anyone else within the studio) before submitting his or her anonymised proposal on a given deadline.

Joseph Mackey, one of the students of the studio SoftPraxis reflects on this in his project report:

> As diploma students at an architecture school that actively tries to challenge this autonomy, it was telling how easily the difficult "critical" way of thinking was discarded in-favour of easier ingrained routines and normative architectural procedures. In many ways the adversarial, pressurised environment of the Hard Sell informed the classic architecture students' response: there was an unquestioning obedience to the dogmatic, paternal voice of the online journal, a heavy reliance on the form and visual appearance of the project and a noticeable tendency developed to try and tick off all the assessment criteria (frequently only token gestures were made to context, sustainability and costing). We all resorted to coping tactics. No one really proposed a radical challenge to the functional and programmatic determinants of the brief. The prevailing trend was simply to parcel up the programme into an ordered rationalist bundle, wrap it in an attractive façade and present it as finished artifice. Essentially the assumption that an architects' role is to "design buildings" was upheld. (Mackey, 2008, p. 19)

What we had not told the students was that the promised jury (a person from the Council, a board member and CEO of a local organisation, a tenant for the proposed building and Andy Groarke of Carmody Groarke) did not exist. We had never invited anyone and had never intended to. Instead, the students were to be the jury, role-playing in pairs each member of the invented panel (Fig. 7.3).

Overall, we were at the same time pleased and depressed – and Joseph Mackey's reflections mirror this. Pleased that so much of the work met the expectations of the competition, many in a mature and sophisticated way. Pleased that we have so much stuff to work on, deconstruct, debate. Depressed how a normative brief and a normative competition system can make everyone play the architect game quite so expediently. What is sacrificed on the altar of hard sell? Or should we just be pleased

**Fig. 7.3** Students of the MArch Design Studio SoftPraxis playing at being the architect Andy Groarke. [Copyright: SoftPraxis and The University of Sheffield]

that architecture students can so quickly get out stuff that looks like architecture, and forget about research, mapping, process, politics, sustained ideas?

*On the Production of Space.* THE SECTION OF SPACE ASSIGNED TO THE ARCHITECT – PERHAPS BY "DEVELOPERS", PERHAPS BY GOVERNMENT AGENCIES – IS AFFECTED BY CALCULATIONS THAT HE MAY HAVE SOME INTIMATION OF BUT WITH WHICH HE IS CERTAINLY NOT WELL ACQUAINTED. THE SPACE HAS NOTHING INNOCENT ABOUT IT: IT ANSWERS TO PARTICULAR TACTICS AND STRATEGIES; IT IS, QUITE SIMPLY, THE SPACE OF THE DOMINANT FORCE OF PRODUCTION [. . .]. (Lefebvre, 1991, p. 360)

Lefebvre describes the problematic notion that space, not unlike the fragmentation of knowledge into separate disciplines, is compartmentalised and divided into discrete plots to be manipulated remotely and objectively by the expert hands of the architect; an expert who will work within a predetermined set of conditions and a given site whose boundaries are defined by a thick solid line. Yet, what Lefebvre hints at is that there are important things beyond the purely physical at work.

Architects respond to client demands. They are given plans on which a site is demarcated with a line indicating the site's extension. This line is concerned with ownership yet at the same time it gives the architect his or her territory. Whilst this

should not mean that an architect's responsibility is only restricted to the area contained by this line, it often does. So, suppose this line was drawn not as a solid line but as a hashed one or even omitted. The act of making it permeable, even removing it could be an opportunity to consider the responsibility of the architectural process in far more expansive terms. It would open questions that go beyond the production of buildings as commodities, and approach design as a process that concerns the motivations behind a project, why and how it is produced, by whom and whom for. Transgressing, transcending and simply crossing the boundaries of a line (which could be understood as the crossing of disciplinary boundaries), as in the previous example of the Mikado sticks, allows for architecture to work in other ways and let in other forces and other opinions. Whilst this is a far from a genuine transdisciplinary approach to architecture it might at least be doing away with this line in thinking (Fig. 7.4).


**Fig. 7.4** Anna Holder, Softscape, MArch Design Studio project 2006. The Plot drawings were an attempt at mediating a landscape of social friction. Paint is layered on to "hard" line drawings, tracing connections and lines of sight, proposing a more fluid interpretation of a site. [Copyright: Anna Holder and The University of Sheffield]

*Games of Chance.* The students of the design studio SoftSpace had been invited to collaborate with the artist Alex Hartley. Hartley had been part of the project Cape Farewell and began the project "Nymark (Undiscovered Island)" which documented the finding and claiming of a "new" island in the Arctic. The island was only uncovered recently by a retreating glacier and Hartley asked the students for a variety of responses "FROM THE ENVIRONMENTALLY SENSITIVE TO THE ABSURD".[10]

We went to Rügen, an island in the Baltic Sea, combining a field trip with a workshop. Nearby was Prora, the colossal "Strength through Joy" sea resort (KdF-Seebad Rügen) that had been started in 1936 but was never finished. We started with a classical brainstorm session in groups to come up with a brief for the development of projects – which did not work out. Instead, Jeremy and I came up with a free interpretation of the surrealist game "Exquisite Corpse". We proposed a series of headings or categories which the students had to address in turn: each student wrote an answer or idea to one heading before folding it out of sight and passing the paper to his/her neighbour. Each answer was given in complete isolation, oblivious to what has gone before. As Jeremy explained to Alex: *We thought too much 'rational' thought would be wrong, so [we] wanted to work fast and from instinct. Left brain not right.*[11]

Out came strange juxtapositions, multiple story lines and scenarios that would never have come out of one individual hand. The next day, we went out onto the beach and built the scenarios at the scale of 1:10 with snow, ice and sand as the materials.

In the spirit of its surrealist inventors, "Exquisite Corpse" became a way for the group to explore ideas collaboratively, in contrast to rational subjectivity and individual authorship (Fig. 7.5).

*Fragility/Failure. The Inconspicuous Yellow Office (IYO) was a group of MArch students and tutors at the School of Architecture, University of Sheffield. IYO was part of the Live Projects (six-week long projects that aim to bring groups of students together with real clients in real projects) that have been run by the school for a number of years. The IYO was different to other Live Projects because, on the one hand, it was part of the larger research project PEPRAV (European Platform for Alternative Practice and Research on the City). On the other hand, IYO was set up to research, document and analyse all the other Live Projects. IYO aspired to be part of every Live Project by infiltrating other current Live Projects, investigating past projects and seeking the potential for future projects.*[12]

Nobody liked us, really.

We set out to question the sometimes problematic nature of collective practice and the various ways of setting up collaborations. We wanted to find out how Live Projects could be more than just a transitory involvement, how we could engage and take responsibilities on a longer term project (along side and beyond the academic curriculum). Yet, none of these questions were seen as helpful by the other Live Project groups. We were seen as intruding and invasive, rather than helping. Each

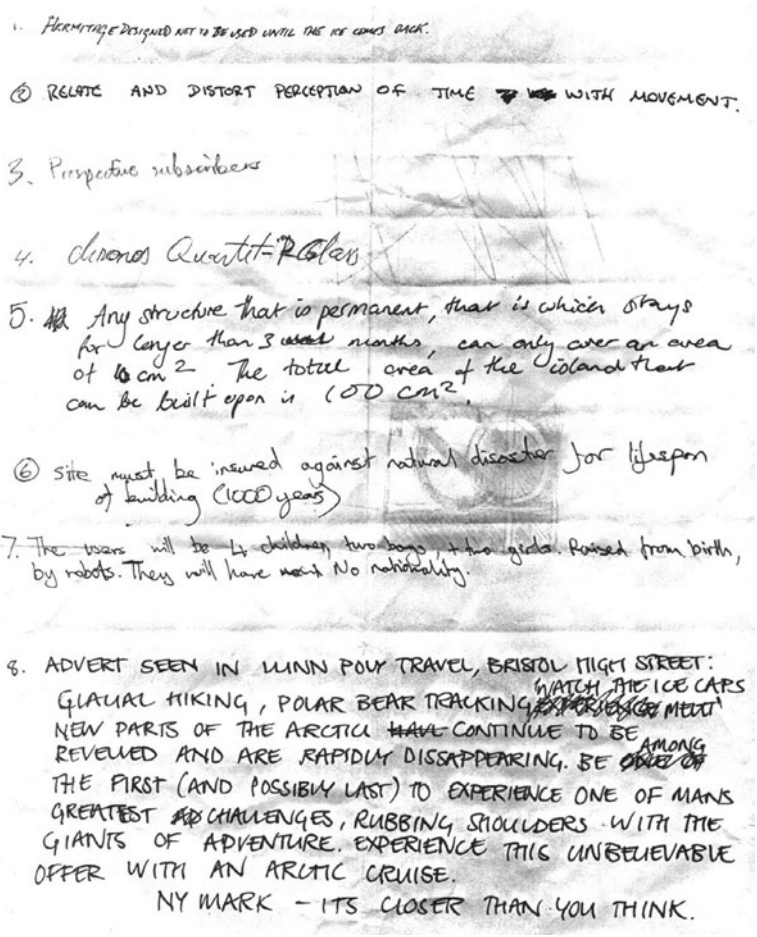


**Fig. 7.5** Exquisite corpse: individual responses to nine categories by 14 designers, each written without knowledge of the previous answer formed the "brief" for three architectural proposals. [Copyright: SoftSpace and The University of Sheffield]

group was happy in their own confinement. To transcend a group's boundaries and let someone else in seemed too much. Hardly anyone understood why we were interested in continuing to ask questions. Why we wanted to learn? For what? To do what?

The aim of the IYO had been to bring together these fragmented sets of knowledge produced within the safe boundaries of each Live Project group. Trying to inform our own project we wanted to set in motion the communication and interaction between a complex set of actors (researchers, students, academics, artists, clients, representatives from local authorities) in order to produce a framework for an intersubjective (in Habermas's sense) platform – but failed.

*On Collaboration.* Whilst the design studio SoftSpace was an attempt at defining other ways of doing architecture and SoftPraxis one in challenging methods of architectural production in the studio setting, the studio Housing+ that I coordinated with Cristina Cerulli set out to produce projects as a collaborative endeavour.[13]

In the spirit of Patrick Bouchain, we wanted to be true to the following maxims: "INVOLVE AS MANY PEOPLE AS POSSIBLE, ENSURE THAT THE VARIOUS DESIRES CONVERGE, ALLOW YOURSELF TO BE CARRIED ALONG, LEAD THE OVERALL PROJECT LEAVING NO ONE ASIDE, COMBINE KNOWLEDGE AND MATERIALS, BRING IN THE USER BEFORE CONSTRUCTION IS COMPLETED, ALLOW HIM TO FINISH, TRANSFORM, MAINTAIN AND, IN TURN, PASS THINGS ON" (Quoted in Towle, 2009, p. 3).

Our studio was set up as a loose partnership between ourselves, our students and a number of people in other academic departments and universities as well as from outside the university. We envisaged and provided the basis for the studio as a research process that is open source as well as open ended, and where every student would be an active member of the research group – where the methods, aims and objectives of this collective production would be identified by the group.

The overall theme of social housing design was explored and researched from a number of disciplinary perspectives, including planning, economics, sociology, organisational science as well as from the points of view of residents, designers, neighbours, young and old people, young parents, people who live alone and so forth. Collaboration became a focus and thread common to many of the design proposals that hinged on collaborative processes or mechanisms, including community self-built, cooperatives and co-housing (Fig. 7.6).

As tutors, Cristina and I had developed a framework to start with, including a field trip and a series of seminars and workshops both within and outside the university setting. The students gradually took more "control" whilst we as tutors continued to guide and coach but, more importantly: we let go. Students took charge of inviting people relevant to their own project, teamed up with their peers within the MArch course, and organised workshops and seminars amongst themselves and, over the course of the academic year became active agents rather than re-active subjects.

*On Wasting Time.* CEDRIC PRICE: ONE SHOULDN'T IGNORE THE DELIGHT THAT CAN BE ACHIEVED FOR THE INDIVIDUAL THROUGH WASTING TIME. THROUGH SPENDING LONGER, RATHER THAN SPENDING SHORTER. SO THAT'S ANOTHER EQUATION. RATHER LIKE JAPANESE ZEN GARDENS WHERE THERE ARE JUST PEBBLES AND THEY RAKE THE SAND. NOW, I WATCHED THAT FOR HOURS. I WATCHED IT EVEN LONGER THAN THE JAPANESE WATCHED IT BECAUSE I WAS INTERESTED IN THE PERSON RAKING THE SAND AND HOW SOON HE GOT BORED. THE FOREIGN OBSERVER, NOT REALISING THE DELIGHT OR REALISING ANOTHER DELIGHT.

**Fig. 7.6** Adam Towle, Open House Alliance, MArch Design Studio project 2009. Using the principles of Open Source Software, the project intends to halt the trend of standard, generic houses that lack individualised architectural input, yet also proposes to place key design decisions in the hands of the user and not the architect. [Copyright: Adam Towle and The University of Sheffield]

*Florian Kossak: Probably we should start to invent elements that enhance the slowing down process or even the possibility of wasting time.*

CEDRIC PRICE: I DON'T KNOW IF THERE IS ONE, BUT I LIKE TO THINK THAT THERE IS SOMEONE IN SOME DEPARTMENT OF SOME UNIVERSITY SOMEWHERE IN THE WORLD THAT DESIGNS BIG ROCKS THAT YOU CAN PUT ON THE ROADWAY BECAUSE IT MAKES IT MORE DIFFICULT TO GO ON THE ROADWAY. BECAUSE OF THE DELIGHT OF GETTING AROUND THOSE ROCKS AND THE TIME IT TAKES TO GET ROUND THEM. (From an interview in Kossak, 2002, p. 9)

Cedric Price puts "wasting time" forward as a tactic, which becomes an indicator of pleasure. He talks about delight in lingering, in seeming purposelessness and about the intentional creation of obstructions where there need not be any. In this sense, it is a call against determinism and for non-plan, against the rule of efficiency and for wastefulness, against the rational and for the illogical, against the most obvious for the ambiguous.

There are measures for time within each discipline: we know how much time it takes to fulfill certain tasks, how long it will take to do certain things. Yet, if working beyond the boundaries of a particular discipline, there is no such measure any longer. Not-knowing, re-negotiating time therefore – amongst other things – becomes a principle of transdisciplinarity.

*Addendum.* Thierry Ramadier writes that "TRANSDISCIPLINARITY IS NECESSARILY BASED ON DISCIPLINARY PRACTICES. HOWEVER, IT IS ALSO BASED ON THE ASSUMPTION THAT THESE PRACTICES MUST EVOLVE TO MATCH THE COMPLEXITY OF THE ISSUES FACING TODAY'S SCIENTIFIC COMMUNITY" (2004, p. 424).

Architecture concerns the world. It sits within it, is embedded within it. As a discipline it might still be relevant; but only if it starts to acknowledge different voices, different collaborations and different authors. And this is something that both teaching practice as well as professional practice need to acknowledge both through conduct and through the way things – education as well as buildings – are done.

I do not and cannot know everything. Collaborations, therefore, become a way of not standing still and recognising that architecture, like every other discipline, has its limits. To admit to multiple realities as one's working ground and to carry this ethos from pedagogy into practice and back into pedagogy begins to suggest steps outside of the alleged linearity of processes.

Yet, it is both the process and the product that needs to be reconsidered as both are inextricably linked. Architecture is not, as so often propagated, about the "ART OF BUILDING".[14] The discussion around architecture needs to move outside of what Iain Borden and Jane Rendell have described as the "GRAVITATIONAL PULL OF THE OBJECT" (2000, p. 5), where architecture equals buildings and making equals technology. We need to look beyond "THE INTERNALISED CONCERNS OF THE DISCIPLINE" (Borden & Rendell, 2000, p. 5) not only to understand it historically but to expand it into the future.

In this text, I have been oscillating between teaching, theory, comments on practice and personal statements and have put forward arguments in a loosely and associative manner in the hope that the various strands of enquiry would gradually converge to explain a position. Yet, having arrived here, it seems important to reiterate that transdisciplinarity, if applied only as a working method, misses the point.

Unless working in transdisciplinary ways becomes a qualitative tool, unless it becomes a means of choice with ethics and values attached, then it does not mean much. Hugo Hinsley argues that "NEITHER EDUCATION NOR THE STRUCTURE OF THE PROFESSION NOR THE DESIGN AND PRODUCTION OF BUILDINGS CAN BE SEEN IN ABSTRACT; THEY ARE ALL AFFECTED BY THE SOCIAL, POLITICAL AND ECONOMIC FRAMEWORK OF OUR SOCIETY, AND A PART OF EDUCATION IS TO CONSIDER AND QUESTION THIS FRAMEWORK" (1978, p. 9). What Hinsley reminds us of is that architecture, neither as object nor as process, neither in practice nor in education is neutral. Yet, we need to do more than just consider and question, more than just mediate and facilitate. To be involved in architectural education, for me, means being able to discuss architecture not as the simple imparting of skills or techniques but as something where these skills and techniques become tools of change, of transformative action.

## Notes

1. The students of the design studio SoftSpace were: Chris Brightman, Dan Burn, Sam Goss, Philip Graham, Anna Holder, Peter Merrett, Anca Milache, Tom Price, Lisa Procter, Ruth Queally, Basim Shamsuddin, Kenji Shermer, Daniel Wiltshire and Jamie Wakeford.
2. Email on 13 May 2006 from Anna M. Holder to Tatjana Schneider and Jeremy Till, "project introduction/ design report summary", 2006.
3. Email on 19 January 2006 from Basim Shamsuddin to Tatjana Schneider and Jeremy Till, "softspace catalogue", 2006.
4. The quote refers to the text *On safety pins and other magnificient designs* which was published by Price in 1972 (Price 1972) and (Price 1984).
5. From a text prepared by the students of the design studio SoftPraxis (co-ordinated by Jeremy Till and Tatjana Schneider) at the School of Architecture, University of Sheffield for the event "Architects for Sale" during the 2008 London Architecture Festival.
6. For a full set of the criteria for RIBA Part 1, Part 2 and Part 3 see: *Royal Institute of British Architects. Criteria for Validation*, 2003.
7. This is related to a question posed by An Architektur in reference to a co-authored paper presented at the Camp for Oppositional Architecture in Utrecht in November 2006. For the full text and the Q&A session, see Schneider and Till (2007a).
8. The Softpraxis website (2007) can be seen at http://softpraxis.wordpress.com/category/tutorials [accessed 9 January 2010].
9. The students of the design studio SoftPraxis were: India Aspin, David Cook, Lorenzo Dwyer, Rachel Harris, Hannah Lambert, Joseph Mackey, Alastair Parvin, Chris Patience, Alexandra Pitney, Kevin Ryan, David Sparks and Naomi Taylor.
10. Email on 21 December 2005 from Alex Hartley to Jeremy Till and Tatjana Schneider, "undiscovered island", 2005.
11. Email on 01 February 2006 from Jeremy Till to Alex Hartley, "Look what you've started", 2006.
12. IYO were: Paul Bower, James Brown, Peter Buist, Florian Kossak, Pui Yu Zue Lee, Doina Petrescu, Matt Plummer, Kevin Ryan, Tatjana Schneider, Julia Udall, Thomas Vigar and Emma Williams. Other participants in discussions included: Kathrin Böhm, Carolyn Butterworth, Leo Care, Prue Chiles, Alan Deadman, Colin Havard, Pierre Jambé, Mark Kingsley, Rosie Parnell, Constantin Petcou, Jeremy Till, Sam Vardy.
13. The students of the design studio Housing+ were: Ben Asbury, Leanna Boxill, Adam Dainow, Sarah Green, Tomas Kangro, James Kenyon, Tom Kirby, Osamu Masaki, David Rozwadowski, Aditi Saxena, Peter Sofoluke, Adam Towle, Kieran Walker and Craig Western. We collaborated with: Anna Holder, Mel Davis and the Heygate Tenants and Residents Association, David Rosenberg, Dominic Church and CABE, Paul Hodgson, Duncan Bowie, Stephen Hill, Indy Johar, Tony McGann, George Evans, Jack McBane, Bill Halsall and the Eldonian Community Based Housing Association, Amanda Baxter, David Rodgers, Nishat Awan, Stephen Proctor, John Gillespie, Dan Usiskin, Judy Torrington, Jim Reed and Dan Burr.
14. For example: Edinburgh School of Architecture and Landscape Architecture ESALA, "Home. Welcome" (2009). http://www.esala.ac.uk [Accessed 17 November 2009].

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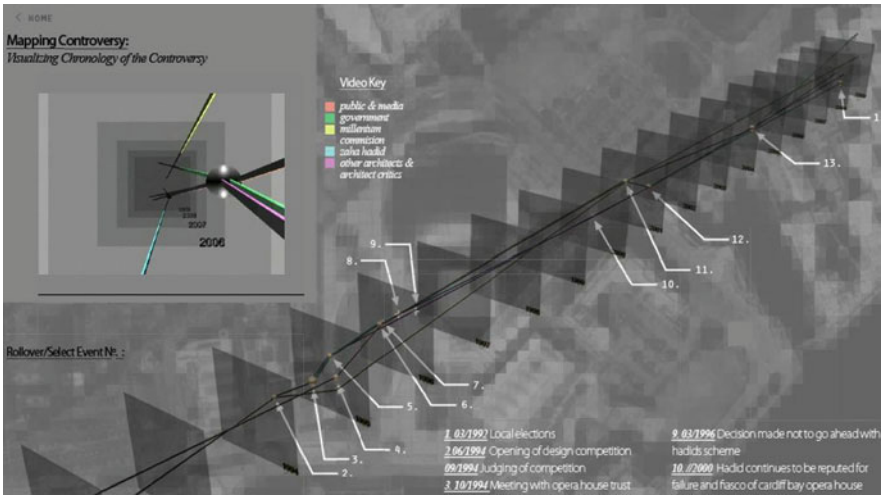
# Chapter 8
# From Reflecting-in-Action Towards Mapping of the Real

**Albena Yaneva**




Mapping of the Cardiff Bay Opera Controversy (2008/2009). Courtesy of Peter Brown, Lindsay Griggs, Natalie Harris, Abigail Phillips, and Sean Wilkins

Donald Schön's (1983) concept of "reflection-in-action" made a revolution in design anthropology in the 1980s, founding a new epistemology of practice, one that stands the question of professional knowledge on its head by taking as its point of departure the competence and artistry already embedded in skilful practice. This type of studio-based reflexivity can be followed in many architectural schools today, and is commonly privileged by the professional schools of many research universities. If reflection-in-action stands against the systematic, scientific, linear way of knowing,

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I. Doucet, N. Janssens (eds.), *Transdisciplinary Knowledge Production in Architecture and Urbanism*, Urban and Landscape Perspectives 11,
DOI 10.1007/978-94-007-0104-5_8, 

what kind of enquiry could complement the systematic way of knowing about architectural theory? I will argue that architects today need to engage more with a pragmatist type of architectural enquiry that would be a situation-based, distributed way of learning about architecture and its various entanglements, rather than one that would rely on a stable stock of systematic, scientific knowledge. An experiment in introducing such a pragmatist, self-exemplifying mode of engaging with architecture will be discussed here – Mapping Controversies – and some results of this educational experiment will be presented and discussed. As opposed to the reflective studio-based learning of what it means to design, Mapping Controversies implies an out-of-the-studio way of learning *about* design, which is simultaneously an out-of-the-auditorium mode of questioning the multifarious connections of architecture, society, economics, culture, and politics.

## 8.1 Two Types of Enquiry

Let us follow Petra (a student) and Quist (the coach) in their attempt to design a building. The example is taken from Schön's *Educating the Reflective Practitioner* (1987). They discuss the project and as they do so, they also sketch different buildings. That is to say, a reflective mode of designing. This reciprocally reflective dialogue of coach and student happens in the studio. Their design process traces a web of projected moves and discovered consequences and implications, sometimes leading to a reconstruction of the initial coherence – a reflective conversation with the materials of the situation. We follow Petra and Quist's conversation with materials and shapes. Drawing and talking, Schön informs us, are parallel ways of designing and together make up what he calls the "language of designing". Petra is stuck. She has tried to place the shape of the building into the contours of the land there, but the shape does not fit into the slope. Quist criticises her framing of the problem and he repositions the problem as follows: "you should begin with a discipline, even if it is arbitrary… you can always break it open". In the media of sketch and spatial-action language, he represents the site, draws and redraws different options, and simultaneously evaluates the consequences of every move on the sketch. Each of these moves has implications binding on later moves, and each of them can potentially create problems to be described and solved, sketched and re-sketched. Thus, Quist designs "by spinning out a web of moves, consequences, implications, appreciations, and further moves" – that is how Schön recounts what it means to design. Both Petra and Quist engage in a reflective conversation with the situation. Each move is a local experiment that contributes to the global experiment of reframing the problem. It is a reflective process: "As Quist reflects on the unexpected consequences and implications of his moves, he listens to the situation's back talk, forming new appreciations, which guide his further moves" (Schön, 1987, p. 57). Design progresses as Quist reframes the problems posed by the student Petra and engages in a reflective conversation with the situation and the implications of the new design moves.

Here is another type of enquiry: We are in the midst of 2006 with the controversy surrounding the proposed expansion of London's Heathrow Airport. Robert, Aisha,

Joe and Sophie plunge into the press clippings and image galleries on the web to try and unravel all the traces this controversy has left in the digital sphere: archives of the Heathrow developments; governmental papers; press clippings covering the community and activists' protests, images, and videos. They are my Architecture students, and I am not a coach in the studio, but a lecturer in Humanities. They learn about the nature of dissent, they identify the actors, they stare at a complex timeline of the controversy that incorporates all the actors, and they follow the different events. Images and YouTube material inform us about the key actors and we can literally hear their voices: "voices from the remembrance service for the victims of climate change on the taxiway at Nottingham East airport held by the Baptist minister, Reverend Malcolm Carroll, held on 24th September 2006"; "Voices of protest from the 14th – 21st August annual climate change camp held at Sipson. Over 2,000 people attended"; "Voices of protests from 21st March when Plane Stupid activists do a banner drop near Edinburgh airport". And we can extend the list. Robert, Aisha, Joe and Sophie immerse themselves in the complex data sets that allow them to reflect not only on the design of the third runway and the sixth terminal to London's Heathrow airport, but on all those issues design is related to: How would the new terminal affect climate change? How many surrounding homes would the expanded airport destroy? How would the new design affect the residents of the village Sipson? Will the campaigns against Heathrow's expansion change any of the design plans? Thus, as my students collect data on the controversy and try to analyse and visualise it, they actively engage in a type of pragmatist enquiry called mapping the controversy.[1] Tracing the actors' trajectories, drawing their diagrams of relations and the timeline of the controversy while collecting the data, they do not simply deal with the sketch and the design coach, but rather interact with a much vaster and heterogeneous assembly of actors: the London Mayor Boris Johnson, greenhouse gas emissions in addition to nitrous oxide levels, Greenpeace, environmental impacts, the West Drayton Residents' health concerns, the activist group Plane Stupid, environmental, aviation and welfare groups, celebrities like Emma Thompson and Alastair McGowan supporting Greenpeace, airlines like Cooptravel and British Airways, British Airports Authority, and so forth, all become part of the complex ecology of the proposed airport expansion. When dealing with all these actors, Joe and his team do not learn what design is; they rather learn about *what design does* – what kind of effects it can trigger, how it can affect the observer, divide communities and provoke disagreements; they immerse themselves into the many consequences of design practice and gain an awareness of its various implications. So, if Joe, Robert, Aisha and Sophie were about to design a new terminal, especially after the controversial fame of the recent Terminal 5, would they still stay in the studio, absorbed in a meditative dialogue with the sketch, staring at a model and "engaging in a dialogue with materials and shapes", trying to solve the paradoxes of design? No, they would rather plunge into the design world outside the studio and face its complex ontology.

What kind of enquiry is this, and how does it differ from the studio type of reflection-in-action? (Schön, 1985) Would it still require the designers to engage in a meditative process of communicating with materials and shapes in search of the good airport design? Or, is it a meta-reflexive analysis of what could explain

design by situating it as much as possible into reflexive frameworks (that is, a critical theory-inspired view of architecture)? No, none of these can describe the mapping controversies exercise in which Joe and his friends engage. It is neither purely reflective nor a meta-reflexive enquiry. As compared to the studio reflection-in-action that deals with the uncertainty of design, taken in the specific materiality of cognition, the mapping is rather a self-exemplifying type of enquiry that deals with the consequences of the manoeuvres of all actors involved in situations of uncertainty, their implications, their changing positions and opinions. As Joe and his team search among the piles of articles in the library and navigate databases and image galleries on the Internet, they witness a web of moves composed of all the actors' stances involved in the controversy. This exercise is not about designing a building, and trying to fit it into a slot; but rather about weighing up the impacts a building could have, evaluating the consequences of design and its implications. The mapping does not advance by a subsequent reframing of the problem or by the sketching and re-sketching of different options and possible scenarios; it progresses rather by following all extending webs and multiplying their proliferation through the enquiry. In the first case, Petra and Quist try to understand what their building will look like and how to design it in a better way by solving all the problems of site, scale, materials, and shapes. While in the second case, Joe and his team try to comprehend the consequences of design and the web of shifting positions within the controversy.

In fact, you could argue that the two types of enquiry are not comparable at all. One occurs in the US during the 1980s, the other, in the UK in 2009; one involves a student and coach; the other, a group learning environment with a lecturer; one refers to a situation of learning *to* design; the other, implies situations of learning *about* design; one could be quickly called "design practice"; the other, "design theory"; one will take its inspiration from Technology; the other, from Humanities. And if we were to continue the list of comparisons, we would get deeper into the dualism of Technology and Aesthetics, Architecture and Society, Theory and Practice. Sceptical of the rationalism that distinguishes Art from Science, the mapping controversies method makes an attempt of endorsing and cultivating through teaching a specific attention to the performativity of design.

In this essay, I refer to Schön's study in order to shed light on the differences between a reflective enquiry, one that is bidirectional, with the self-exemplifying multidirectional type of enquiry implied by mapping controversies. In the former, the designer and the result of his design are affecting one another in a situation that renders both directions into a relation of cause and effect, where every design move "bends back on" and affects the entity instigating the action. There are many ways of comparing the design reflexivity of Petra and Quist described by Schön with what typically happens today in a studio's practice. Whatever the differences we could establish, the types of reflectivity accounted by Schön can still be found today. Moreover, there is a variety of other data that designers take into account when designing: they do not engage in solitary coach-and-student problem-solving with the help of a sketch; this dialogue with sketches and shapes is complemented rather by an intense search of data, design precedents, image retrieval, fresh actors'

statements, archival materials, government papers, and data about the architects in charge. These new sources of design inspiration would imply a different mode of communication with materials and shapes, a different type of cognitive practice. The thinking about what they are doing while they are doing it makes the *drawing* design practitioners reflective, while the mapping designers are rather "*surfing* practitioners". You could object to this perhaps rash comparison, and say, "but many professionals today rely on browsing large amounts of data at the beginning of every enquiry". What is it that makes the surfing Joe a design practitioner? If design happens by surfing and drawing, how do designers today find their way within these various datasets – the digital masses of data on their computers and the heaps of drawings, paper cut-outs and physical models in the studios? How is it that this type of hybrid enquiry, with tracing paper and screen pixels, travels and generates a new type of design practice?

To answer these questions we will leave Petra and Quist for a while arguing over the sketch and reframing design problems, and focus on the mapping venture that Joe and his team are about to undertake. Why do they deal with controversies rather than simply with buildings and shapes? What is a controversy and how does this type of enquiry lead us to a different epistemology of practice and has different implications for design education?

## 8.2 What Is a Controversy? What Is Mapping Controversies?

The methodological and conceptual roots of this approach stem from the discipline of Science Studies with the writings of the French sociologist and philosopher Bruno Latour forming the primary source for its subsequent development. Latour first developed his ideas in relation to the analysis of scientific and technological controversies (Latour, 1987). According to the MACOSPOL project:[2] the word "controversy" refers to every bit of science and technology which is not yet stabilised, closed or "black-boxed"; it does not mean that there is a fierce dispute nor that it has been politicised; we use it as a general term to describe shared uncertainty. Controversy analysis is the educational application of Actor-Network Theory (ANT), a method of enquiry that questions the traditional epistemology of the social sciences (Latour, 2005; McLean & Hassard, 2004, 2007).

Following a decade of teaching and exploration of this methodology in relation to science and technology issues, it has been explored how this new approach could be extended to other disciplinary areas, such as design and architecture. This can be considered just a stage in the development and extension of this evolving inter-disciplinary area of design studies and ANT (Latour & Yaneva, 2008; Yaneva, 2009). Thus, drawing on controversy mapping theory and previous teaching experience in *École des Mines*, I engaged in a new mapping experiment in 2009. I asked my BA architecture students to use their advanced design skills to draw, map and visualise not an object (typically a building or a site) but a controversy, i.e. a complex ecology of connections of an architectural, cultural, economical, and political nature. They followed and mapped different controversies focussing on the dynamic

debates surrounding particular buildings or construction projects ranging from the redevelopment of Manhattan's Ground Zero to the reform of 1930s modernist high-rise buildings in Sheffield, England.[3] Controversy, I explained to them, does not refer particularly to media debates, scandals, rumours surrounding design plans, uncertain architectural knowledge, buildings-in-progress, tentative technologies or building innovation. Controversy points to the series of uncertainties that a design project, a building, an urban plan or a construction process undergoes; a situation of disagreement among different actors over a design issue. It is rather a synonym of "architecture in the making". Mapping controversies means "analysing controversies" and covers the research that enables us to describe the successive stages in the production of architectural knowledge and artefacts, buildings and urban plans. By mapping controversies we also refer to a variety of new representational techniques and tools that permit us to describe the successive stages of controversies.[4]

In their attempt to map the Heathrow controversy, Joe and his team returned to the library and spent many hours browsing the Internet. First, they started by following the controversy. Following it required that they be able to trace the dynamics of the controversy in time: the actors (individuals, groups or institutions), their arguments, the different positions and how they change and progress over time, the spaces in which they develop, the many ways of closing and re-opening the debates, and the extent of public involvement and participation in the process. Second, they documented the controversy and collected a variety of materials and compiled a research dossier composed of press clippings, images, and interviews with architects, clients, investors, public bodies, concerned citizens, and users. They added materials and extracts from the literature related to other buildings of a similar type, looked for information from governmental papers and archives, and examined architectural plans, drawings, and diagrams. Third, and the more challenging step for them, was to map it, i.e. analyse and visualise – to present the chronological development of the disputes surrounding the airport expansion design plans, but also to represent it with visuals; to capture the dynamics, visualise the timeline and the weight of the different actors' positions. They also made videos and used materials available on YouTube, as well as related podcasts that were made accessible through iTunes. They provided visualisations of how the actors' positions disperse or converge, and how a personal position might change the whole configuration of arguments and the spacing and timing of these arguments. Thus, the creative use of visuals led them to *trace* the dynamics of the controversy and its changing argumentative spaces.

The students have no definitions to learn, and no strict recipes to follow; they should describe what they see with the variety of tools available, meaning that they must be attentive to the details to find a uniquely adequate account of a given situation. This is an experiment for two reasons. First, because my students should restrain themselves from explaining the design with a single theory or viewpoint; for instance, the political factors or the ecological crisis that would give a particular shape to airport design. Second, they should try to observe the controversy not only through the singular design viewpoint or through the narrow glasses of the sketch (as Petra and Quist would do in their studio). Joe and his team should put different hats on their heads when trying to unpack what such a design project means. They follow

it from as many viewpoints as possible: the village inhabitants, the land occupants, the aviation companies, the pollution, the planners and the designers, the celebrities, the airport authorities, the carbon dioxide emissions, etc. They listen more to the voices of the actors than to their own presumptions. Trying to ignore the design critics and theorists for a while which will provide quick and easy explanatory schemes, Joe and Aisha, Sophie and Robert listen rather to what the actors will say, and forget (even for a while) all presumptions of what this controversy might be about.

Using new objects of research and new techniques of representation, Joe, Aisha, Sophie and Robert do not simply tell a story about a possible/impossible new design of Heathrow. They also tackle the classic question of representing the subjects of design, whose composition is always variable. The mapping refers to the variety of tools that permit us to describe the consecutive steps in the production of architectural knowledge, focusing on visual representations of the stakeholders, linking their various interests and tracing their development through time. The same tools used by Joe and his team in the studio to document and represent static objects are used here to trace their dynamics, to become immersed in design ecologies. There are many digital technologies that students can employ, and I encouraged them to choose freely from both what we provide and also what they may find on their own initiative. The software used to embed these actors into a representational space ranges from basic web tools such as web page editors, Flash and Java, to 3D visual software, in accordance with the content that the students are dealing with. All and all, the design students have succeeded to create novel modes of visually incorporating controversy studies suited to a digital format.

The results were presented in websites in the form of descriptive accounts of design controversies. The controversy and its moves are described on the websites. The aim is not to unveil some general structure of social and political factors concealed behind the phenomena. The only purpose of the websites is to provide the most detailed description of the phenomena as seen by their protagonists. As Latour says, "If your description needs an explanation, it's not a good description" (Latour, 2004, p. 67). The visuals used by architects in-studio do not simply represent, but rather deploy, the distinction between description and deployment. In the first step (following the controversy) and the second step of the enquiry (documenting the controversy) the students just observe and describe what they see and find, thus putting aside any social theory, any meta-reflexive frameworks, that would explain particular courses of actions or the specific nature of actors. Then, in the third step of mapping, they deploy with design virtuosity the ontological charade they find when studying a controversy on the move.

Let us look at the maps and the inventive use of design visuals and we can witness that (Figs. 8.1 and 8.2):

(1) Design controversies involve all kinds of actors: activists, groups and single architects, aviation companies and wind resistance, farmers and celebrities, house owners, and runway drawings.
(2) Every controversy functions as a "hybrid forum", a space of conflict and negotiation between actors (Callon, Lascoumes, & Barthe, 2001). *Forum* refers to

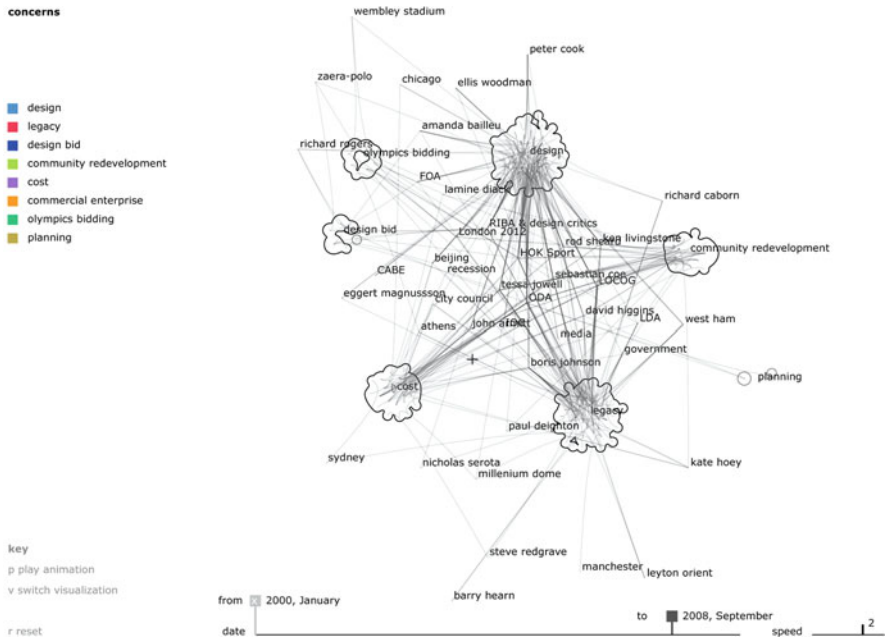


**Fig. 8.1** Map of the London Olympics Stadium design controversy. (Credits: Christian Derix & Aedas|R&D, Albena Yaneva and Liam Heaphy)

those particular spaces in which various groups can meet and debate different issues and the technical choices of importance to the community. They are *hybrid,* because the people involved and their representatives are heterogeneous: experts, politicians, clients, architects, technicians, and concerned lay people. *Hybrid,* also, because the questions to be tackled are of a different nature: from political and ethical concerns through to mechanical engineering and aesthetics.

(3) Controversy displays the design and the social in a very dynamic way; design precedents and communities, pollution protests and design concerns. The actors never appear alone, but in a network.

(4) Following controversies will also prevent students from falling into the trap of reductionism – reducing and explaining the protest to the runway with the political climate, cultural changes, or social factors. These are easy frameworks of explanation.

(5) Controversies open "black boxes" – things and understandings that otherwise will be taken for granted. Before this runway controversy many people were not aware of all the environmental effects of aircraft or of the fact that the government can forcibly purchase your house.

(6) Design controversies recompose cosmologies. Very often the proposed change in a controversy will reconfigure entirely the connections of existing actors and recompose their worlds. It is crucial for an architect to understand the cosmology of the users for whom he is designing. The architect seeks to trace the

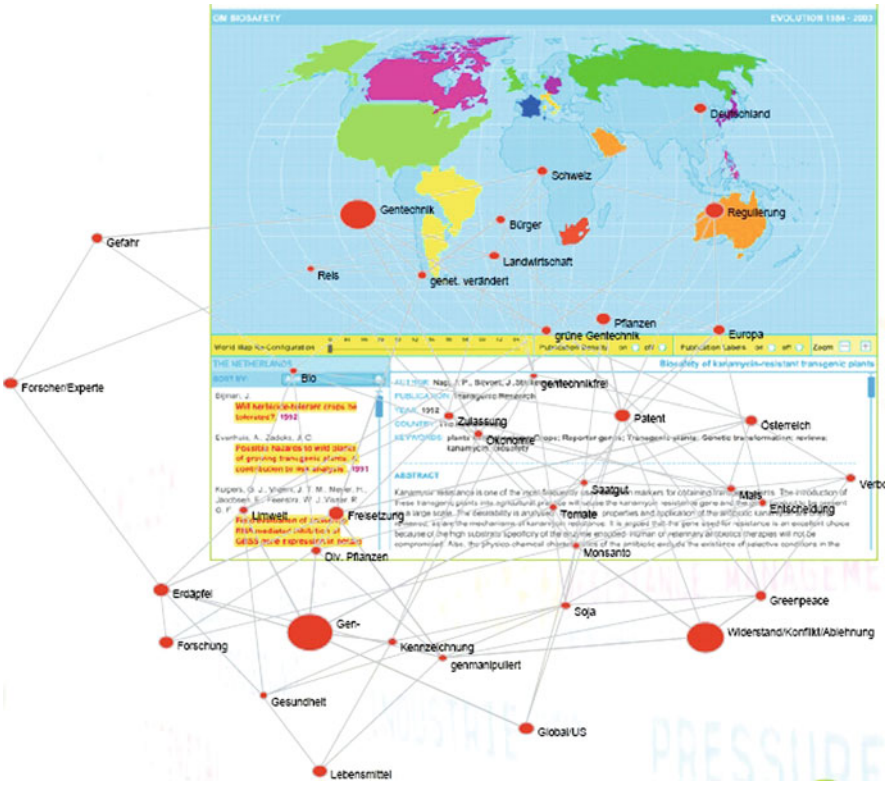


**Fig. 8.2** Experiment in mapping. (Credits: Patricia Reed)

cosmogram of their world by identifying and tracking the practices followed by various sets of actors (e.g. clients, actual and future users, contractors). For this reason architects do not ask, "Are you for or against this spatial solution, this design option, this architectural idea?" All that this alternative question can do is generate different opinions. Instead, architects ask, "In which world do you live?" "How is this world structured?" "With whom and with what are you ready to share it?" "What do you cherish the most?" "Who are your allies, and who are your critics?" "How does change happen in *this* world and alter entire cosmologies?" They try to understand its inhabitants and what those people believe in, what they cannot live without, and what they cherish the most.

All of the visuals show the students' awareness that a building, seen through a series of contested projects and users' demands, resembles much more a complex ecology than it does a static object. In this experiment, buildings reveal their nature as "things", i.e. as gatherings of many conflicting demands. They cannot be reduced to what they are and what they mean, as architectural theory has traditionally argued by adding "symbolic", "human", "subjective", or "iconic" dimensions to

them. These visuals (e.g., animated plans and sections, actorial diagrams) talk about the "thingness" of architectural and urban projects. Aiming to understanding controversies in urban design and architecture, this experiment also brought theory and practice together by reconnecting and strengthening the synergies between them.

## 8.3 From Reflecting-in-Action Towards Mapping of the Real

Such an understanding of a building as a plethora of material and subjective considerations, and as the result of a protracted process involving multiple concerns, will move beyond the traditional two or three-dimensional image, reaching out to represent additional human factors, and indeed reducing the need for distinctions between subject and object. Look at the sketch of Petra: we are in a simple Euclidian space. A building that we witness in a controversy mapping is rather reminiscent to "navigation through a controversial datascape", an animated collection of "criss-crossing trajectories of unstable definitions and expertise". Rather than merely adding external concerns to objective entities, the students' visualisations make a step towards the invention of a visual vocabulary that will do justice to the idea of buildings as "things", contrasting with the older and more reluctant view of buildings as objective static objects.

Both the design enquiries of Petra and her coach and those of Joe and his team deal with uncertainties. We gain valuable insights about the meaning of design in these enquiries. For example, the rhythm, intensity and scope of the disputes; the dispersion of the actors' positions; the trajectory of their arguments; the spacing and timing devices; and the different ways of slowing down the pace of the controversy and closing it. Thus, the designer in Schön's account is someone who deals with uncertainty, with complex, incoherent and messy situations and converts them (here Schön follows Dewey's view of the designer) to a determined form; they "*construct* and impose a coherence of their own" (Schön, 1987, p. 42). In our mapping controversies case, the designer is one that recognises and completely takes into account the complexity of design by observing it, before then simplifying it through the production of descriptions and visualisations. "When we *observe* controversies, we focus on the liquid side, as only in quarrels, disputes and flights, can new actors make their way to the surface of society. When we *describe* controversies, we contribute to the solidification of some portions of social magma reducing its complexity to a manageable level. Both tasks are equally important and closely connected in the practice of social cartography" (Venturini, 2010, p. 11). The experiment of mapping controversies makes us perceive design as being concerned with the entire web of moves that are traced by the actions of design; it is about property, swarms of birds, affected nature, polluted air, the destroyed coherence of the neighbourhood, contested zoning regulations, costs, local politics, legacy, and community vitality. It is much more complex indeed than simply trying to put a building on a site and adjust its scale, gradually solving design problems.

The links between architecture and society are traditionally explored in their solid states. Instead, following controversies allows us to witness the social and

the architectural in a non-stabilised state where all is melted. Follow the actors in a controversy, how they agree and disagree, how they shape alliances, how they scale and rescale the spaces where they move and create spatial disjunctions. Here is where you find the social. The cartography of controversies is conceived as a toolkit to cope with the different hybridisations of actors and knowledge, as an effort to follow disputes when they cut across disciplinary boundaries. Mapping design controversies pushes the investigation of architecture students far beyond the limits of sociology and history of design, not only towards neighbouring human sciences but also towards technology and even the natural sciences. Questioning the new Heathrow Airport runway will lead us to question climate issues, airline politics, and landowners' property rights. How can aviation companies profit better from the design? What kind of impact can a new terminal have on the environment? How will the property prices change as the construction progresses? All these issues are not technical minutiae but important questions that lie at the core of the controversy and deserve greater attention. This realistic mode of enquiry greatly differs from the reflexive enquiry and the meta-reflexivity-based approach in design education. Through mapping controversies, architects learn that a building is something to be scrutinised, investigated and sought. It is not "out there"; it is to be followed and mapped. Only through a constant attention to the performativity of design can design education sustain its integrity, value and effectiveness. Developing the mapping controversies approach is a way in which design education can have a future.

## Notes

1. The Mapping Controversies method was initially developed by the French sociologist Bruno Latour and applied across a variety of disciplines. The method offers a new way of enquiry in social sciences based on Actor-Network Theory, which consists in following, documenting, and mapping ongoing controversies. Mapping controversies implies a research method, a teaching philosophy, and a way of approaching public debate. It is used largely in the fields of Sociology, Political Sciences, and Engineering Studies, and primarily in French-speaking Universities across Europe. Only recently was the teaching method introduced in English-speaking Universities with Manchester (Architecture) being a pioneer in this field, along with Oxford (Geography) and MIT (Science Studies). All these institutions form part of a teaching consortium and have a website platform managed by MIT: http://www.demoscience.org.
2. MACOSPOL stands for Mapping Controversies in Science for Politics, and is an EU-funded project (http://www.macospol.com) realised by the following institutions: Science Po-Paris, University of Munich, University of Oslo, University of Manchester, École Polytechnique de Lausanne, University of Liège, and Observa, Italy. The project led to the construction of an interactive web-based platform (http://www.mappingcontroversies.net).
3. A web-based platform "Mapping Controversies in Architecture" was set up in Manchester (http://www.mappingcontroversies.co.uk, or http://www.msa.ac.uk/mac). This platform is devoted to understanding urban controversies and bridging the gap between theory and practice. The methods have the potential to serve as an example for other disciplines, especially given the rising interest in Actor-Network Theory from a range of disciplines like Geography, Anthropology, Organisation Studies, Planning and Landscape.
4. For a collection of resources, see http://www.demoscience.org (Resources); for a selection of tools relevant for design education, see http://www.mappingcontroversies.co.uk (Resources).

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