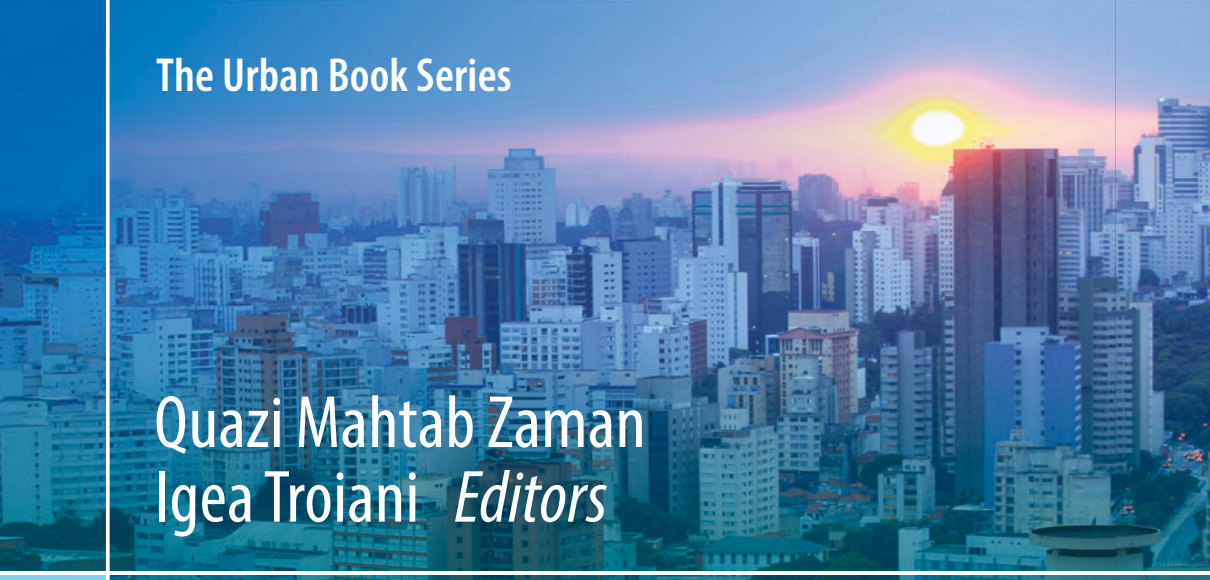

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Quazi Mahtab Zaman
Igea Troiani *Editors*

Transdisciplinary Urbanism and Culture

From Pedagogy to Praxis

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Editors

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Igea Troiani, Ph.D. is an academic and architect-filmmaker. She is the founding director of the research film company, Caryatid Films and the Oxford-based architectural practice, Original Field of Architecture Ltd. Dr. Troiani is co-editor of *The Politics of Making* and is founding editor in chief of the award-winning international journal *Architecture and Culture: Journal of the Architectural Humanities Research Association (AHRA)*. She was Chair of AHRA from 2009 to 2012 and has been a Steering Group member since 2006. Her teaching, textual research and film-making as research practice centre on the positive exchange between disciplinary and transdisciplinary knowledge in Architecture Humanities.

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Part I
Background: Transdisciplinary Urbanism and Culture

Introduction: Transdisciplinary Urbanism and Culture

Quazi Mahtab Zaman and Igea Troiani

Abstract This book originates from the contemporary research approach and ideology centred on inter-disciplinarity to examine issues in urbanism and culture. The crux of that research lies at the heart of academic institutions, in particular the way in which various disciplinary discourses are available and the manner in which researchers are currently trying to address issues in urbanism and culture with inter-disciplinary research methods and approaches. This introductory chapter opens up different aspects and dynamics in urban research. It shows how established and early-career researchers are conceptualising and attempting to address various urban research strands, which were discussed at the 9th Annual AHRA (Architectural Humanities Research Association) Research Student Symposium.

Keywords Transdisciplinary · Pedagogy · Praxis · Urbanism · Culture · AHRA

Transdisciplinary Urbanism and Culture: From Pedagogy to Praxis is a collection of critical, multi-disciplinary essays on urban research by established and early career researchers who participated in the 9th Annual AHRA (Architectural Humanities Research Association) Research Student Symposium.[1] The authors

[1]The symposium was held at the Scott Sutherland School of Architecture and Built Environment, Robert Gordon University in Aberdeen from Saturday 19th May–Sunday 20th May 2012. It was organised by Quazi Mahtab Zaman. Guest speakers included David McClean, Richard Laing, Gokay Deveci, Rosa Cervera and Javier G. Pioz from Architects Cervera and Pioz, Madrid. The conference was run with IDEAS Research Institute, Robert Gordon University with Knowledge Partners, IDEAS (RGU); Waste Concern; Global Built Environment Network; and Global Built Environment Review. Igea Troiani attended and presented a conference address as Chair of the AHRA (2009–2012).

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depict contemporary research issues in urban development in search of new and fresh approaches that reflect the changing principles and praxis of urban conditions. The common ambition is to create new lines of knowledge enquiry in urban research. Due to socio-economic, political and technological changes to urban production and patterns of consumption and a drive for inter-, cross-, multi-, transdisciplinary practice the essays more or less mirror the ideological shift occurring in faculties of research and external academic research organisations.

The non-profit academic organisation, AHRA was established in 2003 to promote, support, develop and disseminate high-quality research in the areas of architectural history, theory, culture, design and urbanism. AHRA also aims to consolidate an emerging collective voice in architectural humanities and architectural design research that seeks to go beyond the strict confines of academic work defined by established research organisations in the United Kingdom. The AHRA gives academic kudos to individuals working in research and practice in the architectural humanities, whether from an institutional base or an independent situation such as architectural, urban and arts practitioners. It is purposely not a learned society with membership open to all at no cost. This benefit allows AHRA to provide an inclusive, multi-disciplinary network of researchers in architectural humanities across the United Kingdom and overseas. At the point of publication of this book, AHRA had over 1200 members worldwide from around 50 countries. The collaborative, critical, global and cross-institutional nature of the AHRA continues to enable and support many activities that allow formal and informal dialogues to occur when they might not otherwise. In an increasingly competitive institutional higher education context, where space for, and acknowledgement of new scholarship that goes beyond the boundaries of conventional research is changing, AHRA offers its members the opportunity to participate in conferences and disseminates the work of its members through a range of self-driven publications.

The AHRA hosts two conferences per year as platforms for knowledge dissemination. One is the Annual International AHRA Conference for emerging and established researchers, held around November each year and from which the AHRA book series *Critiques: Critical Studies in Architectural Humanities* and conferences issues of the international, interdisciplinary peer-reviewed journal *Architecture and Culture: Journal of the Architectural Humanities Research Association* are produced.[2] The other conference is the Annual AHRA Research Student Symposium for mostly emerging scholars and typically run in May that has resulted in ancillary publications such as this book. While other conferences have included urban research within their discourse remit, no other AHRA conference to date has focused on Changing Principles and Praxis in Urban Research. This is

[2]The Series editor of the *Critiques* series is AHRA Founding member, Jonathan Hale. Eleven titles in the series have been published by Routledge between 2007 and 2015.

The Editors-in-Chief of *Architecture and Culture: Journal of the Architectural Humanities Research Association* are Igea Troiani, Suzanne Ewing and Diana Periton. Three issues of *Architecture and Culture* are published per year. The journal was launched in November 2013 and is published by Taylor and Francis.

because of the high quality of material presented, discussed and debated at the Aberdeen conference by delegates from Spain, Norway, Scotland, Ireland, England, Canada, Hungary, Indonesia. The themes based on 'New Urban Conditions transforming the way we perceive urban issues and recognise new research strands' that this publication was produced. The Aberdeen conference sought to uncover the ideologies and methods that are fundamental to generate the built environment arguing they warrant a renewed re-evaluation. The renaissance in thinking presented here will help urban managers (architects and allied professionals) prepare themselves to countenance the improbability of the new and emerging urban conditions.

In alignment with the aim of the AHRA to support transdisciplinary discourse and research, the authors in the book present research in and across the disciplines of urban planning, landscape architecture, architecture, engineering, environmental science, environmental psychology, politics, anthropology, post-colonial studies, philosophy, history, and sociology. Through examining public space and urban planning in-between and across these disciplines, the authors offer insights into new inter-disciplinary knowledge and approaches to urban pedagogic practice. The themes of the essays reveal our attitudes to the very pertinent issue of sustainability, the impact of globalisation, the need to limit material use, the surge in overpopulation in some parts of the world. The themes also indicate how we might need to reconsider our relationship not only with our cities but also with nature, wildlife or uncivilised landscape through interrogating the urban either through design research or writing. The essays in this book respond to the questions: What are the current polemical debates and urban principles, issues and findings in urban research that allow us to look at and design our cities and architecture differently? What are the emerging methods or praxes in (inter-disciplinary) urban research?

To work discursively across and in-between disciplines, this urban research extends the palette of disciplinary praxes typically used. Using existing and new methodologies that include filmmaking (animation), new digital technologies, participatory design, visual ethnography (photography), and so forth, our understanding of practice on the urban is stretched beyond the quantitative into more speculative, playful and contemplative approaches to the cities and places in which we inhabit.

New Principles for Urban Design Practice

Throughout history, the city, architecture and public realm have tested many ways to address issues faced by generations. Methodologically various theories aided urban researchers and designers in responding polemically to urban issues and facilitating options in solving urban problems imaginatively. 1950s criticism of mid-century city planning and urban design triggered our reliance on classical urbanism—walkable streets, a socially-responsive built environment, a socially and culturally engaging public realm—to comprehend urban context. Urban design discourse and the profession have been increasingly seen to use economically-driven actions in place making and marketing. With the growing trends in anchoring 'sustainable agendas'

into professional and academic arenas, urban concerns concentred on various strands of ecological parameters. Technological breakthroughs pushing the boundaries of urban praxis into new imaginary possibilities are helping to shift our mindset to define and visualise urban conditions in more pragmatic and holistic manners.

Today urban discourse has turned to technology to solve urban issues. It is becoming more hybrid borrowed from interface theories found in the sciences. Many of the chapters in this book have reflected on new technology as a method to rationalise design proposals and re-visualise traditional spaces in ways that help us cultivate our imaginations. New principles and praxes in urban research today offer a great leap forward to a new journey of conceptualising and re-fabricating the design thinking process. The boundary of 'phenomenology in place and spaces' (Norberg-Schulz 1980) allows the authors to draw inspiration from philosophical and cultural movements of various periods including modern times.

Pedagogy and Built Environment

In "Pursuing Resilience in Architectural Design through International Experimental Projects: Exploring New Boundaries in the Design Studio Pedagogy" Silvia Bassanese, Benedetta Rodeghiero and Aida Espanyol present a new pedagogical reasoning by demonstrating a shift in the traditional studio teaching and design exercises (Bassanese et al. pp. 23–39). The research reflects a deviation from the traditional boundary of teaching methods, where the authors have engaged in system thinking as the major tool in responding to more complex urban crises that global cities are experiencing within which the struggle for both academics and practitioners is to act responsibly in designing and delivering sustainable built environments. The authors demonstrate a unique educational setup, Build Our Nation (BON) and its first application in the Taifa Letu Tujenge (TLT) through an international collaborative method applied in the design studio environment. This method sets a new principle and praxis in the process of conceptualising and delivering necessary urban transformations in our changing globalised world. This points to the deficiencies our Higher Educational Institutions have in comprehending real life teaching scenarios and the authors have reconceptualised the meaning of the university as 'manufacturer of real world projects'.

In Yasser Zarei's "When Practice Dictates Change: The Necessity of a New Framework in Architectural Education" (pp. 41–51) the development of new interdisciplinary urban design practice is seen possible through bridging the space between artistic practice and methods of digital drawing and representation. Zarei argues that to achieve true interdisciplinary praxis in urban design, the designer needs to manoeuvre in-between and across a mixture of disciplinary boundaries. In the instance of digital design, Zarei argues that the use of digital software used in other related design fields does not constitute an adequate platform upon which the architect-urban designer can operate. Zarei calls for a change in the knowledge and praxis in urban research and for the architect-urban designer to learn software

programming to develop a process of design praxis. To achieve this, Zarie proposes the curriculum for architecture courses needs to change so that digital knowledge can be given to the urban designer making new technologies serve their means rather than be a servant to less relevant ones. This argument proposes a significant pedagogical shift to the education of the architect and urban designer since it provides them with inter-, multi-disciplinary praxes from the outset of their training.

With the similar attitude towards nature and environmental concerns, Rosa Cervera's 'Recycling the City: A New Pedagogical Approach to the City of the 21st Century' (pp. 53–72) debates the challenges humanity now confronts to maintain the growth and sustainable management of cities today. Central to all crises is the demographic shift, perhaps, a conventional mindset in setting scapegoats in the situation where we fail to accommodate growing population in an urban 'black-box'. Anything we have done to bring changes to the built environment seems ineffective and has fallen into the trap of reinventing the wheel without shifting our focus to the concept of retention, otherwise known as 'recycling or reuse'. How can a city be reused? This would perhaps be a major change in the way we have treated the city. Cervera exposes, through her own Design Studio of the "University Master in Advanced Project in Architecture & the City" (MUPAAC) offered at the Alcalá University (Madrid, Spain), a state-of-the-art pedagogical approach demonstrated by the "Recycled City". In the 'Recycled City' various methods have been tested, such as fractal volumes, decomposition, disintegration and prototyping housing styles. Interestingly the figure-ground theory by Trancik (1986) has also been reframed as 'Built and Vacuum' analysis as a reflection of how urban researchers are changing with the intention of generating new guidelines and methodologies to look at the traditional and contemporary urban crises. Requalification of the blocks is such an attempt to seek a new method to reinvent urban conditions within the existing footprint.

Philosophy and Built Environment

"Cloud10: Inflated Ideas" by Lisa Cumming (pp. 75–88) uses animation to propose a new lightweight and adaptive approach to articulate form and spaces in which society can live flexibly. Cumming argues a shift in material construction and a focus on mobility will allow a more dynamic and site responsive buoyant urbanism thereby reducing 'the lethargic nature of architecture' (Cumming, p. 78). It will also alleviate the impact of human inhabitation on the ground plane—in this instance on the fluctuating Antarctic landscape. Based on the practice-based research and design work of Category 5—a team of MArch (Architecture and Urbanism) graduates at the Architectural Association School of Architecture in London, of which Cumming is one—"Cloud 10: Inflated Ideas" and the urban design work contained in it proposes a more fluid and dynamic architectural program which presents a shift in principles and praxis in urban research. Through using the time-based drawing media of animation rather than conventional architectural drawing, the architect-filmmaker-urban

designer's practice is extended so that, to quote the British mathematician, Gordon Pask (cited in Frazer 1995), "the role of the architect, here […] is not so much to design a building or city as to catalyse them; to act that they may evolve".

Using a cinematic methodology as the focus of enquiry Maryam Fazel discusses in "Live Montage in Mediated Urban-experience: Between media and architecture" (pp. 89–97) how the concept of montage as understood in film studies can be reframed to enhance the design of the urban place and the architecture of everyday life. The juncture between realism and the virtual that struggles to reinstate our sense of perception within the urban realm that is often diluted by the fragmentation of semiotics brings the question of the 'point of indiscernibility' (Deleuze 2005). Fazel's interpretation of live montage repositions our concept of the real and the virtual and their inter-relationship, sometimes an undefined territory. Fazel establishes these territories through borrowing from media and architecture as two disciplines and examines their interfaces to understand the experiential yet virtual relationship between body, place, time and image. This is defined as 'Time montage and place montage' where architecture 'becomes the site of interface between reality and virtual'. Fazel also brings in new technologies. Our contemporary lifestyle reliant on social media that collectively gives us the 'circular repetitive temporal sense of time' and where as soon as we check our mobile phones for new emails our perception of the temporal structure of time is triggered to go beyond the conventional perception of what constitutes the notion of 'past, present and future'.

Christian Parreno's "Boredom in Space" (pp. 99–109) sets out a history of the principle of our modern condition of boredom and how it relates to our experience of space. Referring to the writings of mostly philosophers, Parreno argues that boredom as a part of the modern experience, emerged due to the industrialisation of labour grounded in regular working hours and patterns. As a consequence, our contemporary 'standardised way of life' (Parreno, p. 105) means that our cities have changed. The industrialised city is a noisy one with "cars and lorries in the streets, industrial noise, and the resemblance to a wasteland". What Parreno concludes from his classification of three types of boredom—individual, modern and historical—is that due to changes in patterns of standardised work life, people adept with technology living in the contemporary city are moving between an interior personal (virtual) world space and the external public (physical) world space more fluidly than before. Modern boredom requires that we be titillated in both domains differently—and in the case of the real space and the architectures within it—we need to respond increasingly to our desire for satisfying physical and sensorial experience in a world of ever-growing excess. Pleasurable spatial engagement of the void spaces in-between internal and external domains requires the immediate attention of architects and urban designers.

Sociology and Built Environment

Antonius Karel Muktiwibowo's "A Street with Informal Regulation" (pp. 113–125) expands on the established territory that intersects urban design and research with studies in sociology and social activism. Muktiwibowo sets out a debate on the fundamental urban economics in urban design, by establishing that the 'smaller denominator of urban activities', that cities in the East rely on, are more about 'informality' than a formality that occurs in the West. They do so by sustaining economic activities and ensuring livability in maintaining the community ambience. Informality, or informal economic activities in cities, is seen as the precursor to invigorating the public realm that emerges within the formality of urban regulations —a somewhat natural progression that many cities in the East are structured around. This allows a renewed interest in formalising 'informality' as a way to address sustainable planning processes to recognise the relevant socio-economic conditions with which many cities in the East have defined their public realms coherently.

Rully Damayanti discusses the 'third space', otherwise known as 'informal space' that clusters around marginalised society in slum situations. Informal Space is a well-established issue in fringe societies that has been researched by Mukhija and Loukaitou-Sideris (2014) in their *Informal American City: Beyond Taco Trucks and Day Labor*. Due to "[…] globalization, deregulation, and increasing immigration flows […]" informal activities aiming to have economic gain, and manifest in the 'underground economy' (Mattera 1985), are visible to consumers taking advantage of low-cost consumer goods but strategically invisible to law and enforcement agencies trying to eradicate the pseudo growth of 'third space'. In '"Kampung Kota' as Third Space in an Urban Setting: The Case Study of Surabaya, Indonesia" Damayanti (pp. 127–139) re-establishes informality as the wealth or resources in a city which creates an 'underground or uncharted' economy (Mattera 1985) which originated at the cross-road of urban and rural, named as 'Kampong Kota' in Surabaya, Indonesia (Kampong—village/rural and Kota—urban). The chapter uses very significant arrays of sociological urban theory—Lefebvre (1968), Bhabha (1994) and Soja (2000)—to establish the notion of space as the reflection of time and society as proponents of structuring [third] spaces. Third Space or Informal Space, if defined in real economic terms, is an urban opportunity that brings life into the city, provides a clear planning agenda that recognises this third space and regulates in a manner that safeguards formal spaces and other public realms using mechanisms of co-habitation.

The chapter by Richard Bower (Bower, pp. 141–152) 'Lefebvre's Treatise on Dialectical Materialism and the Work of Developmental architect, John VC Turner" focuses on Henri Lefebvre's spatial contextualization of Marx and Engels' methodology of dialectical materialism or 'diamat', which originated in the philosophy of science and nature. Bower's chapter tries to re-contextualise Lefebvre's renowned observations of a spatial trialectic—perceived, conceived and lived—within his earlier observations of praxis as a descendent of Hegel's notion of sublation.

Praxis and Built Environment

In "Good Places through Community-led Design" (pp. 155–164) Vera Hale discusses the value of community-led design for generating 'good places' but debates its inherent definition and modality of participatory design.. The Glass-House Debate series, analysed by Hale, generates our debate on the very traditional norms and ideologies of 'participatory design' that keeps us busy at all aspects of 'community responsiveness' through design. Glass-House (Hale, pp. 155) stems from a charity to skill building as a community-led design. Hale argues it should be seen alongside other community enhancement programmes elsewhere as this is a subject not within distinct geographical boundaries. More widely, the value and implications of 'participatory design' (Hale, pp. 159) are recognised since the objective of participatory design is always debatable in its strategic value to the society as a whole. Hale brings out common issues, such as 'Inspire to Aspire'; 'Empowerment; 'Expectation' and the value of participation amongst society who, regarded as 'social capital', are the recipients of any outcome that can be generated through the involvement.

In "A Study on the Schemes of the Inner Ring Road of Sheffield in the Early Mid-20th Century" (pp. 165–179), Like Jiang discusses the merits of the ring road system as engineered to solve traditional social problems, such as congestion that affect everyday life and the economy. The ring road seems the issue that points not only to physical form as a generator of mobility but, rather a social value that sustains—by organised movement in the manner in which road users in Sheffield view the ring road—as a facilitator of sustainable city functioning. Jiang's specific case refers to various other strategic solutions, one of which is General Motor's Futurama Pavilion. Through the historical positioning of the ring road in Sheffield, this localised urban issue has strong relevance in other urban problems faced by many developed and developing countries.

Jordan Lloyd in his essay "Strategic Design: Implications for Wider Practice" (Lloyd, pp. 181–192) attempts to depict the general uncertainty in decision-making about urbanism and sets out how institutions and professionals would seek alternatives to decision-making with a strategic approach to uncertainty. Strategic design, in particular, demonstrates a viable option for meeting the needs and objectives of any large-scale projects. Lloyd emphasises the contextual value of strategic design, such as is the case in the United Kingdom, but questions the pedagogical value in the educational settings as a truly integrated system widely capable of changing the urban realm in any parts of the globalised world. The significant role of designers should pitch strategic design practice to gain advantages over conventional methodologies.

New Methodologies in Urban Design and the discipline's search to implement the good design by planning practice is a growing need as global and local are in the crux of transformation with the immediate and long-term effects of technology and environment as two prime dominating issues in urban research.

"Bionic Science as a Tool for Innovation in Mega-cities" by Rosa Cervera and Javier Pioz (pp. 193–212) seeks to explore nature as alternative sources of technological solutions in new building practices. Cervera and Pioz question the way nature is considered balanced and sustainable. They argue that learning through nature is a valid pathway towards innovation in urban conditions that is unpredictable; urbanised and demographically over-stressed. Referring to their design project in Kolkata Cervera and Pioz (pp. 199) explore and apply by default the notion of nature that is simple, rational and sustainable. Ecological solutions are a centrepiece of Bionic Science that the authors have engaged in the Kolkata project by which the traditional built environment and practices put high leverage on biological sciences depicted in the intricacies and structural coherence found in natural elements. A hybridity in building technology derived from nature demonstrated by Cervera and Pioz indicates the need for a change in design praxis.

In "Search for a Genuine Regionalism: a Regenerative Agenda for the Peripheries", Vilmos Katona (pp. 213–226) redefines regionalism and discusses the marginal societies generated within the dictum of centre and periphery—two extremes in urbanism and a product of globalised techno-society that fails to respond sustainably to bring genuine regionalist responsiveness. Katona's chapter draws on the struggle between regeneration to reposition new urban order giving significance to the marginal world. By questioning what constitutes regionalism (Frampton 1983), Katona believes that genuine regionalism is non-aesthetic or non-modern (Katona, pp. 218) by way of being anti-political and tends to masks the politics of architecture. However, genuine regionalism is free from political dogma. Genuine Regionalism is real and essential to reinforce the reality of localism where authenticity and pride help shape and strengthen the truth of locale.

Changing Principles and Praxis: Reflections on the work of the AHRA and their 9th Annual Research Student Symposium

So, what are the current polemical debates and urban principles, issues and findings in urban research that allow us to look at and design our cities and architecture differently? What are the emerging methods or praxes in (inter-disciplinary) urban research? The discourse presented in this book brings new attention to changes in principles and praxis in urban research through the use of creative inter-, cross-, multi-, transdisciplinary practice modes of knowledge and research practice.

The protagonist event for this publication, the 9th Annual AHRA Research Student Symposium, provided a unique multi-disciplinary platform upon which to discuss the future directions of urban research. One of the most ambitiously organised and thought provoking student events organised by the AHRA, it allowed emerging researchers the opportunity to establish and evolve their personal urban research direction through generous discourse and feedback from delegates. The conference itself aligned with the aim of the AHRA to create friendly inclusive research environments through which to develop individual research projects but also to build a greater network in the researcher's field. *Changing Principles and Praxis in Urban Research* offers an exemplary model for forthcoming student symposia because it validates the contribution of the delegates whose work offers

thought provoking methodologies or visions for urban research. While some of the essays presented in this book conceptualise research along more traditional routes, it is the intellectual and critical assertions about urban research that make this volume a unique contribution to knowledge in the field.

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Reflection 1 The City: A Shift in Mindset?

David McClean

Abstract Human migration to urban centres is at an unprecedented level, prompting searching questions about their design and enablement, politically, economically, technologically, or socially. Rapid urban development is laying challenge to existing paradigms, and demanding fresh thinking and radical new models. Historic ideas founded on ideals are increasingly outmoded, yet optimism about the potential for future betterment must remain, particularly within the architectural profession.

Keywords Cities · Urban development · Utopia · Agency · Education

As a human phenomenon, the city occupies a central position in our collective architectural interest, ambition and vision. The importance of this pre-occupation was underscored late in 2011 at the point where, for the first time in human history, we became a predominantly urban species. As such, our cities serve as crucibles for the generation of social, cultural, and economic opportunity.

Speaking in Aberdeen in 2012, the academic Pier Vittorio Aurelli asserted that architecture maintains an ambivalent relationship with the city. The expansion of his thesis included drawing a distinction between the architecture of the city and the phenomenon of urbanisation as the consequence of systemic economic and political motive forces. However, his assertion that there are limits to the influence of the architect in the context of urban development prompts important questions about notions of the agency as a professional model in the construction of the future city, and of inter-disciplinary expertise. Important, because it seems clear that for architects not to play a significant role in urban development would position the profession on the margins of irrelevance. Important too because we need to re-evaluate our methods, relationships, and educational processes. So it is both reassuring and necessary that the work included in this book demonstrates a continuing fascination

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with the urban condition and its many complex dimensions, and the role that architects can play in its development, working collaboratively with others.

The magnitude of the challenge facing urban structures and communities around the world is unprecedented and daunting. On the one hand, we see the effects of rapid urban expansion in cities such as Shanghai or Mumbai, while simultaneously we are witness to the problems of economic decline in centres such as Detroit, with devastating consequences for social cohesion and the physical structure of these cities.

In the first years of this century, earth's human population exceeded 7 billion, and it is predicted that over the next 25 years this figure will grow by a further 2 billion (United Nations 2011), the vast majority of whom will be urban dwellers (Mohan and Dasgupta 2005). In India alone, life expectancy has increased by 26 years in the last 50, and in China by 32 years in the same period. Indeed, it is projected that urbanisation in Asia will double within 2 decades. Although to date our cities have exhibited a remarkable capacity to absorb growth, urban expansion is now occurring at an unprecedented speed, causing developmental objectives and processes to adapt and change (Alliances 2008). The global mega-city, or primate city, possesses a scale that fosters new dynamics, particular complexity, and a unique coincidence of events and processes. In developing countries, growth tends to outstrip infrastructural development, resulting in uncontrolled sprawl with inadequate servicing and unregulated property markets. Such growth positions the informal settlement as the dominant architectural and urban form, a new global vernacular. As a consequence of such expansion, many cities have an innate vulnerability due to environmental degradation along with the ingredients for social unrest such as poverty and social inequality. Hence, the global city encapsulates one of the most significant dichotomies of our time, namely the vital role that cities play as economic generators versus the deteriorating conditions within these urban structures, which if left unchecked, ultimately become self-defeating. The nature of social composition in the global city, coupled with the complex dynamics of contemporary economies, contains an inherent paradox that can be traced back to the writings of Plato; that of 'social polarisation' caused by the co-existence of significant wealth and poverty (Smith and Timberlake 1995).

Rates of urban expansion demand new mindsets and means of delivery as governments can no longer afford to fund the infrastructural needs that are vital to civilised urban development, or to satisfying the political imperatives exerted by continued commitment to economic models of growth. The entire economic landscape is in flux, constrained by political paradigms that favour the short-term. So, how can these seismic forces of change be influenced or ordered by architectural thought? What are the visions for the future that address these questions, and according to what political or sociological ideology?

The utopian ideals of the 20th century as represented by the planned cities, whether realised or remaining propositional, were dominated by the social and political ideals of Modernism. Indeed, Isaiah Berlin described the utopian dream as the great project of the 20th century. Sir Thomas More's definitive conception of utopia of 1516 was a mythical island, remote and self-sufficient in the vast expanse of the Atlantic Ocean (Ames 1969). The characteristic of disconnection has come to

typify the notion of utopia, as utopic ideas have represented our imagination of an alternative to the prevailing constraints and limitations of the society of the time. Today, acknowledgement in some quarters of a resurgent interest in the notion of utopian thinking (*inter alia* Pinder 2002), runs counter to what Bletter (1993) expresses as a prevailing 'absence of hope in the future'. Such despondency emanates from a belief that earlier visions are, and have proved inadequate for the complexities of the contemporary urban condition and the wider context within which it requires to be considered. Although some regard continued interest in utopian ideals as vital to critical discourse (Pinder 2002), it would appear that the notion of transcendent reality is evaporating. Current scepticism about the utopian ideal is markedly at odds with the thinking of the 20th century that led to the great yet flawed experimental visions of the planned city, or what Alexander termed the 'artificial city' (Mumford 1992). Ideas such as those developed for Chandigarh or Brasilia represented the notion of 'cities of salvation' (Pinder 2002) in direct lineage to Victorian thinking such as Howard's concept of the Garden City. Reflection on the current challenges imposed on the environment by human expansion, coupled with continual media discussion about the sustainability of our species might easily lead one to conclude that conditions have shifted thinking to a very different point. Arguably, we are ever more removed from any meaningful speculation about ideals. Equally, the fundamental motive force behind the determination of utopian dreams is the desire for some form of betterment, be it sociological, political, or technological. Although future visions may not, perhaps cannot, replicate the ideological clarity or political determination of those of the 20th century, this desire at least remains. The optimism that the imagination and scholarly rigour brought to the realities of today by architects and academics is invaluable. These realities pose critical questions about our collective priorities, about new models, about enablement and agency, about our professions, and about education for the practitioners of the future. In other words, they pose a fascinating panoply of issues that demand thorough exploration through research. The breadth of work contained here demonstrates that many are rising to these critical challenges.

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Reflection 2 Shifting Research Paradigms: Urbanism and Culture

Richard Laing

Abstract The themes of this book are important and timely, and reflect the increasingly cross-discipline manner in which challenges faced in the built environment must be addressed. This has been reflected of course in the calls and projects supported by major research funders, but one can argue that this in turn simply reflects a recognition in society that urban problems are complex, and require a response which draws on a diversity of expertise. The relationships between people and the constructed environment are dealt with using a range of participants and contexts, and the book serves to demonstrate how the academic and professional communities can work together.

Keywords Urban · Complexity · People · Research · Practice

Overview

Over a period of many decades, urban development has led to new issues emerging within the study of architecture and the built environment. A growing realisation of the complex relations between people and the constructed and natural environments have logically invited the study of themes not previously considered part of the mainstream architectural research, with the central notions of what constitutes architectural and urban theory challenged to embrace new directions of enquiry. Within the past two decades, the central position of buildings, building users, design and policy-making in the pursuit of a low carbon agenda has become central to research policy and funding, and has moved significantly to the mainstream.

This shift has perhaps been most manifest in trying to understand the notion of the city, against a background of increasingly scarce resources. For example, need to develop integrated aesthetic and technical responses to the need for low energy

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designs represents in itself a major challenge to all disciplines involved in built environment. The notion of sustainability, while quite clear regarding its actual definition, may be difficult to address fully within the context of architectural projects where opportunities and pleasures concerning the economics, environmental background and social impact of an architectural design may be unequal and difficult to control in any case.

One approach through which architectural practice and research have tried to address these challenges has been a focus on aspects of sustainability. These include, for example, studies specifically looking at the energy consumption and performance of buildings (Berggren et al. 2013) or studies concerning the inter-related carbon footprints of buildings, transportation and other infrastructure (Nye and Rydin 2008). There has also been recognition that humans themselves can have a significant role to play in reducing energy use and carbon emission, primarily through changes in behaviour and lifestyle (*inter alia* Bonham and Koth 2010; Carrico and Riemer 2011), and this has formed a further strand of research activity being undertaken by academia and both public and private external partners.

An important point worth bearing in mind is that much of this research has embraced and modified methods and methodologies, which originally emanated from quite a wide range of fields. The chapters contained within this volume, in addition to dealing with theoretical issues which are clearly central to the development of architecture as a discipline, also draw on approaches taken from the environmental psychology, various strands of engineering, the mathematical sciences (including computing) and methods taken from historical research.

At its best, one could argue that research being undertaken at the moment within the field of architecture is dealing with some of the most pressing issues facing humanity and society. Also reflected in the chapters is a desire to engage with the complex range of individuals and organisations who can both determine and influence the future direction of many architectural projects, but who will also be affected by those projects in numerous ways. For example, at the individual level, that influence may be minor (unless the individual happens to be the client) yet the effect on lifestyle and health could be significant (Jackson 2003). At the organisational level, whilst there may theoretically be greater capacity to influence the original design of new architecture, the manner in which this can be facilitated is in itself complex, and the implications of poor quality design are quite clear in terms of productivity, energy use, sustainability and even staff welfare (Johansson 2009).

Increasingly, governments of both local and national level recognise the importance of a built environment, which is sensitive to environmental impact (both social and ecological), and there has been clear rhetorical support for approaches to urban development, which strive to recognise and address the social implications of architecture. For example, this can be evidenced through apparent political support for new urbanism and various sustainable transport initiatives (at the European level through initiatives including CIVITAS, and through various Interreg strands).

Therefore, and as is evident throughout this book, the approaches and techniques used to analyse research data within architectural research now extend well beyond

those traditionally found within the arts. In order to properly address the complexity inherent within themes mentioned, research questions will often require the application of analysis methods from technical, social and economic perspectives, perhaps in addition to a consideration of aesthetic or historical concerns.

Research Practice

In recent years, there has been a shift in research practice. When considering the range of activities funded by research councils (particularly in the UK, but not exclusively), this change has been manifest in the intrinsically cross-disciplinary nature of large-scale funded research within the built environment (see, for example, the EPSRC 'Sustainable Urban Environments' programme). At a wider geographical level, initiatives by the likes of the European Commission have identified very large-scale themes (e.g. Smart Cities) which often require evidence of innovation in terms of research, the inclusion of both academic and industry-based partners, the expectation that the investigation results will somehow find their way into practice, as well as a desire to undertake research work which is sufficiently original and ground-breaking to merit a place in highly rated and widely read academic journals (the value of interdisciplinary working exemplified in Patterson and Bierlaire 2010). Therefore, this situates much of the research being undertaken by academic departments within a context which extends far beyond theory, yet which demands that the theoretical basis for all research work be sound, and can demonstrate innovation, or the potential for innovation, in a practical sense.

While it is perhaps also true that many key journals within the field still aspire to follow a particular direction of enquiry, it is arguable that those directions often come from research ideas and findings, rather than from an exclusive notion of disciplinarity. Therefore, and perhaps in recognition of this move towards multi-disciplinary working, AHRA is an excellent platform from which to explore these trends. Although many of the chapters contained within this volume have been prepared by authors working individually as part of a doctoral program, the subject matter of most of them lends itself to scrutiny in terms of how the themes, problems, issues and methodologies employed might be seen to take on a different complexion if viewed through the lens of multi-disciplinary participants.

As noted at the outset, in recent years there has also been a clear shift in the subject matter being studied by academics within the areas of architecture and the built environment. Key themes emerging from this volume touch on some of these issues, including research concerning:

- Theoretical underpinning
- Local versus Global thinking and practice
- Concepts of the city
- Cities and health
- Sustainable design and development

– Scarcity
– Ownership and contested values.

It is clear that research concerning urban policy requires an integrated approach if our cities can be allowed and enabled to flourish in the future. An interesting aspect of the chapters contained within this volume is how authors approaching the subject matter from a range of disciplinary backgrounds have developed distinctive themes and theories. The overall subject of a changing urban condition arguably demands an integration of disciplines, with individuals working together to develop innovative ideas, which may not naturally emerge from a single discipline. A challenge for research practice in the future must surely be to embrace interdisciplinary working, and to explore what the implications of such research may be, both within academia and in wider society.

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Part II
Pedagogy and Built Environment

Pursuing Resilience in Architectural Design Through International Experimental Projects: Exploring New Boundaries in the Design Studio Pedagogy

Silvia Bassanese, Benedetta Rodeghiero and Aida Espanyol

Abstract In response to the current global crisis, there is a growing demand for responsible behaviour in designing and building that can accommodate user needs through the design process. This chapter describes an innovative approach to the design process aiming to generate a model adopted by an international collaboration who are reconsidering the traditional design process and addressing a new paradigm of the thinking process. The project is experimental in nature and discusses the educational frameworks in architecture. It optimises a model, which demonstrates breakthroughs and trend-setting educational approaches and is potentially transferable to a range of other professions. The chapter argues that the educational ethos of 'ethic of resilience' should be pursued by pushing the boundaries of the conventional Design Studio towards the formation of adaptive system settings. All the participants at the various stages of the innovative educational framework, named Build Our Nation (BON) and its first application Taifa Letu Tujenge (TLT), have already demonstrated, on one hand to be able to learn from the experience achieved from various stages undertaken in the past, and, on the contrary, to be flexible enough to proceed with changes reflecting on the external conditions. The vision is that the Higher Educational Institutions and, especially, universities must become more co-productive actors in society. It can be useful to think of a university as a manufacturer; and subsequently, a manufacturing company as an advanced workshop; a workshop as a real-world project; therefore, a real-world project connoted back to the meaning of university. This vicious cycle of pedagogy embedded in learning and teaching should be central to any higher education focusing on design and research aiming to inform each other through the values of social capital.

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Keywords System thinking · Breakdown of settings · Practice research · Ethics · Social capital

Introduction

Social capital is the desired collective or economic benefits achieved by the preferential treatment and cooperation between individuals and groups (Coleman 1988). Investigation of social capital cannot, however, be regarded as the only path of resolution for all adverse conditions of this world; but there is enough evidence to illustrate that to some extent investment in research on social capital can play a significant and active role in our society (Woolcock 2000). Philosopher Galimberti (2009) has pointed out the general nihilism of the young generation in Western society is a more common cultural issue than an individual psychological problem. The experimental international model 'Build Our Nation' (BON), described in this chapter, depicts an innovative educational model that allows pragmatic thinking in design and aims at promoting cross-cultural and problem-solving directives through value-guided architectural solutions (Bassanese et al. 2012). BON is an international project by a research group based between the Scott Sutherland School of Architecture and Built Environment at Robert Gordon University in Aberdeen, United Kingdom and the Escola Tècnica Superior d'Arquitectura de Barcelona, Universitat Politècnica de Catalunya in Barcelona, Spain and the Escola Superior d'Arquitectura de Reus, Universitat Rovira i Virgili in Reus, Spain. The group focus on the promotion of innovation in educational processes linking design studio activities. 'Taifa letu tujenge' (TLT), which means 'build our nation' in Swahili, is the first application of BON to a real project using its framework and methodology.

In all the current discourse concerning the need for know-how in dealing with difficult problems and in confronting radical changes, it has become urgent also in the field of architectural design to explore the potentialities of design thinking deeply. The territory opened by recent publications and papers by Brown (2009), Charnley and Lemon (2011), and Dorst (2011) suggest the significance of cross-disciplinary engagements, which are transferrable beyond the core of the design disciplines. This chapter argues that the on-going educational model of BON and its first project TLT be already challenging the boundaries of *design thinking*; thus successfully demonstrating an innovative experimental model of *system thinking* in architecture.

As one of the original contributors to the third generation *systems thinking* at the Institute for Interactive Management, Ghrajedaghi (2011) defines the four foundations of *system thinking, which* are: socio-cultural systems, holistic thinking,

operational thinking, and design thinking. Ghrajedaghi (2011: 88) establishes these foundations by stating:

> The depth and beauty of interactive design and the magic of holistic thinking (iteration of structure, function and process) when combined with the power of systems dynamics, create a competent and exciting methodology that goes a long way in dealing with the emerging challenges of our time by responding to the operating principles of openness, purposefulness, multidimensionality, emergent property, and counterintuitive behaviour of socio-cultural systems.

The frameworks of BON and TLT pull together a group of participants comprising volunteer students, academic members and future users, who collaborate on an international Design Studio and perform interchangeable roles of leadership to develop a chosen real-project. The various activities of TLT are workshops, blogs, performances, exchanges and live events that are mainly led by students in a highly motivated and ethical environment (Fig. 1). Power is enhanced when it is shared when the individual 'disappears' in a collaborative team group and the students are more likely to implement an idea when they have had hands-on intervention in shaping it (Bassanese et al. 2012).

In our *liquid modernity*, where social forms and relationships no longer have enough time to solidify (Bauman 2007), the possibility to get involved in a real-world project requires a matter of competence, knowledge and skills, which are some of the best powers of culture. BON and TLT are pushing the boundaries of the conventional mandatory setting of a Design Studio regarding professional ethics and practice. BON and TLT optimise the social capital of architectural education according to the highly sensitive social context of the real project. In pursuing an 'ethic of resilience', crisis and contemporary socio-economic changes can be perceived as ideal opportunities continuously to reset the relationship between people and their environment.

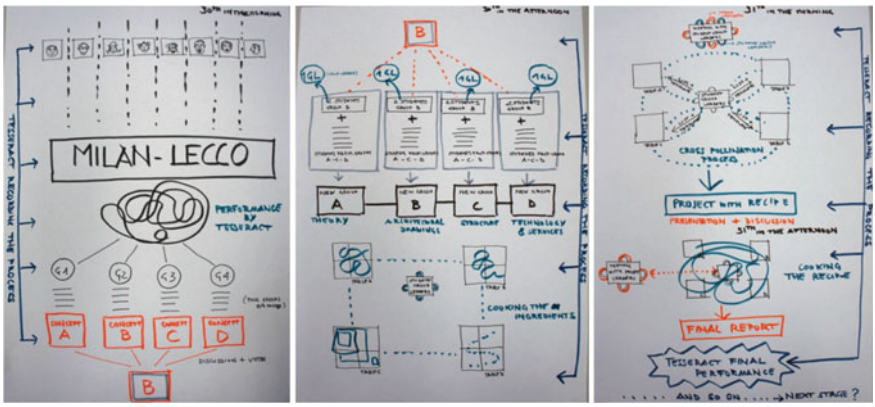

Fig. 1 Layout of the second stage of TLT (*Source* www.buildournation.org)

Research in Search of 'Resilience'

System thinking still represents an unknown territory to be deeply investigated for simplifying the complexity of designing and building processes. It is concerned with seeing through chaos, managing interdependence and understanding choice. *Systems thinking* allows us to understand how various elements in our life, regarded as systems, relate to each other and influence one another within a whole, such as, eco-systems covering air, water, movement, plants, and animals; and how these relate to each other to sustain our planet (Peter 1981). Similarly, BON explores the adoption of a whole systems approach to more sustainable and innovative design. This section of the chapter presents a framework of methodological elements: (a) the need to identify relationships between parts of the system; (b) the requirement for trans-disciplinary skills, and (c) the dynamics of a flattened hierarchy to ultimately optimise the whole. In BON, two main trajectories are under investigation, both strongly linked to the extra-curricular nature of the actual framework. On the one hand, are the educational contexts with the aim of rethinking design. On the contrary, are the environmental-oriented contexts with the aim to rethinking construction. Based on these objectives, the panel of academic members of BON has identified a set of three target issues:

- **Ethical standards and social equity**. The project must adhere to the highest ethical standards and sense of responsibility. The aim is to support social equity at all stages, from the design process to the construction.
- **Contextual impact and holistic thinking**. The project must convey a high standard of architectural quality in the way it addresses cultural and physical values. The aesthetic value must 'interact' with the surrounding environment.
- **Innovation and transferability of knowledge**. The project must demonstrate breakthroughs and trend-setting educational approaches and must be transferable to a range of other applications.

In alignment with the global community commitment to embrace the challenge to reorient itself economically, socially, and ecologically, members of Higher Education have the responsibility to reinvent the teaching, researching, and learning praxis related to the world in which we live and to align with the principles of sustainable development. What is valuable about BON is that it is a process of building a 'resilient' system itself. On one hand, it is 'resilient' because it is adaptive, able to change and learn from experience. On the contrary, it is complex because it is made by multiple and interconnected elements (Holland 2006). BON is establishing an iterative and generative process: from rethinking design to rethinking construction, back to rethinking design and rethinking construction.

"Because the fundamental problem of *architecture* and *culture* is that of *freedom*", as beautifully explained by Branzi (1975: 10–12), educational programmes must be able to help students in pursuing an 'ethic of resilience' capable of returning to the original shape of the world, as after having been confronted by external forces. That is quite problematic for a design research community that

cherishes many oversimplifications of its object of study and delegates many tasks to other disciplines, especially in practice. The vision of BON is 'to set up' highly equipped students by instilling confidence in their skills as future professionals and by strongly challenging the foundation of their education. The nature of this project brings together volunteer design researchers, who are enthusiastic about challenging themselves and the limits of architecture as a discipline outside of the necessary curricular framework. It represents a unique opportunity within academic education for a wider perspective of architecture in a true mutual learning environment with the outcome of a fuller knowledge of architecture and its position in the world.

It might be argued that these kinds of goals be very common in the Design Studio. However, the core of BON is fundamentally defined as a big *playground* founded on some experimental notions of the 'Situationist International' during the 1960s (Andreotti and Costa 1996; D'Anjou 2011). As part of the induction to BON, the first message to the students is: "This is a playground. This is our playground. We all together are the players (Fig. 2). Once agreed on the rules, the game must go on!" BON and TLT are inaugurated by introducing the methodological ground at the outset, and explaining that every space that is room for gaming requires establishing some limits manifested in prohibitions and opportunities for the players. Consequently, BON becomes a playground, and the players are transformed into inhabitants of a new territory (Iacovoni 2003). Because there is a specific ground, there is also an unpredictable transformation under the pressure of the forces that put force on it. In playing through spatial and virtual forms, the playground must continually be redefined, by creating interfaces and/or giving form to a set of rules (Fig. 3). That implies a demanding process of negotiation and joint decision-making between players. It should also be noted that a competitive but playful context helps students to gain knowledge more convincingly.

The space in TLT, where the game of reality is taking place that is the real project's issues requires the players to improve their critical thinking, competence, flexibility, counter-intuitive behaviour, and many other operating qualities related to *system thinking*. Consequently, BON includes a pattern of consciousness of how arbitrary the rules and the unwritten are as well as tacitly obeyed conventions. It

Fig. 2 From grounds to playgrounds

Fig. 3 Self-formation of teams, playgrounds and rules during TLT (*Source* www.buildournation.org)

clearly shows the limits society has drawn for us regarding designing and building and the players have the power to question these rules and, if necessary, to propose new ones. In this process, the emotive challenge of the brief becomes necessary, with the focus on addressing deep social issues through architecture. That highlights the limits but also enhances the ethical approach to architectural designing (Wasserman et al. 2000) in a way current studio projects are not usually assessed.

The first application of BON, TLT consists in the real-world project of designing and building a community centre for women in the city of Bukavu, in the Democratic Republic of Congo (DRC), Africa. TLT involves multitudes of students spanning four Schools across Europe. In April 2011, the collaboration was organised by members from these universities with the mutual help of architecture students. The brief declares: "The African nations set up political objectives for the promotion of women's activities. Women have been marginalised for a long time in the DRC. There are many social and professional activities, which do not integrate women. We want to change these dynamics locally by creating a space where development is catalysed by the participation of the women themselves. This will improve the social and economic conditions for women in the surrounding areas and throughout the city. General objectives of the present project propose to facilitate interaction between women from diverse backgrounds—rural, urban and suburban. This will develop an area of fundamental change to help reduce the complex inequalities women face regarding income and opportunities". In the complexity of the social, political, and economic conditions, this self-built centre will be a catalyst for social change through a participatory and innovative action involving about 1000 women from the province of Bukavu.

By the very nature of the project, many people from professionals and students can be involved. The four different collaborator Schools of Architecture, Built Environment and Engineering across Europe have worked together having a common effort, ethos and aim of positive participation. Having to deal iteratively with the structure of BON (i.e., the major participants and their relationships), the function (i.e., the specific outcomes); the process (i.e., the know-how and the sequence of activities); and the context (i.e., the role the system plays in its

containing environment) collectively imply seeing the whole and understanding it together. It involves a continuous process of re-orientation to fit the rules of the specific playground (Bassanese et al. 2012).

The following section illustrates the modularity of BON. According to Gharajedaghi, a complex product (i.e., TLT but also BON) is made by smaller sub-systems, referred to as the set of distinct but interrelated platforms. Each platform (i.e., the different stages of TLT) hosts a set of special-purpose modules about structure, function, process and context of the overall project (i.e., TLT does not exist if separated from the framework of BON). As in a *system thinking* framework, the relationships and the interfaces among platforms must be explicitly defined. In this innovative project, the parts operate independently with the ability to be relatively self-controlling and to act as responsible members of a coherent system. Practically and at present, there are two frameworks which are running parallel and constantly crossing each other. On one hand, BON is going to become an international research group aiming to explore new trajectories of innovative participatory learning methodologies. On the contrary, TLT is the first trial project in the framework of BON; and represents an important test for evaluating the results in the light of the general outcomes of this innovative educational experiment.

Challenging Design Studio

This section describes the structure of BON and TLT. Because both the frameworks run in parallel, sometimes it is not so easy to identify their limits. Also, it is equally difficult to make a clear distinction between the two. This is due to the reasons that, firstly BON is the original organisation that has a structure within the primary matrix; and secondly, it has nothing of the first application i.e., the real-world project TLT is generated without having a framework. Therefore, every part of TLT is correlated with its other parts (i.e., the progressive stages) and establishes the whole of BON and TLT with a direct and close relationship. Through exploring a territory and trying to orient participants, TLT represents exactly the experience of everybody involved in the project and which is shared from his/her specific role with the other participants, and that represents an itinerant movement that would touch the territory of BON as a whole. Knowing the factors that influence the process of the entire system, the design provides participants with the knowledge necessary to efficiently work within, manage and facilitate that process (Fig. 4). The case study TLT with its operational anecdotes demonstrates those factors.

Concerning BON, a panel of academic members of four different European Schools set up a Memorandum of Understanding to deal with the actual and the future real-projects. Some of those academics have created an international research group, which focuses on innovative methodological developments in studio teaching. The academic members are invited to take part in the leadership of the various stages of the first real project TLT. Until now, three steps for TLT have been organised, and the fourth is currently underway. Under the supervision of the

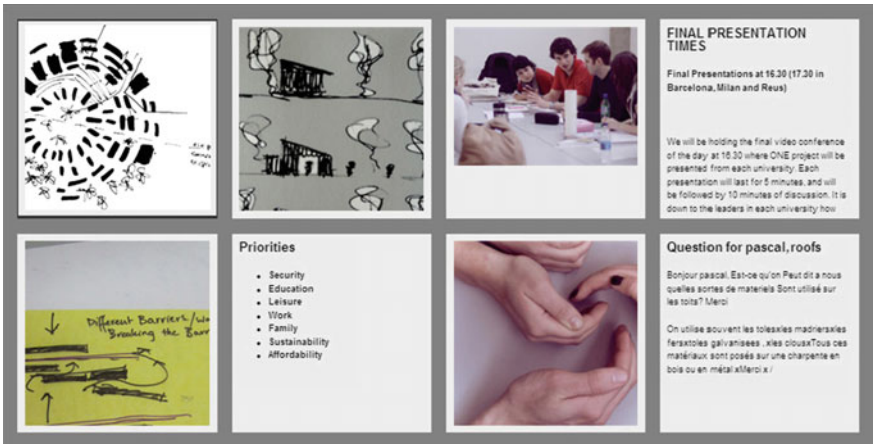

Fig. 4 Blog (*Source* www.buildournation.org)

staff, each stage is arranged by students responsible for leading the events and the activities. The users of the real project, the women of Bukavu in the case study TLT, are involved in the design from the very beginning of the process. There is a permanent exchange of ideas between students and women, which culminates in the final construction of the centre through participatory processes of self-building construction.

The Stages of TLT that

Stage 1 of TLT involved about 250 students from the four European Schools and was led by a collaboration of architecture students. Each School worked independently in mixed vertical groups of about eight students from their institution. The only common institutional rule was that the students should include members from Year 1 to Masters level to guarantee the cross-pollination of ideas independently from their knowledge. The specific outcome of the first stage was to brainstorm ideas creatively and to synthesise them quickly into visual concepts, done over only one day. The concepts were then finalised into three A2 sheets comprising: the social aspect, the technical aspect and the exhibition graphics (Figs. 5 and 6). The goal of the event was to build a visual dictionary of concepts and information to be used in the following stages. A conference at the end of the day engaged student leaders across Schools to exchange and share initial ideas. Web conferences and a blog were also in place to guarantee continuous media feedback, bearing in mind that the use of IT facilities as common tools for the young generation yields very effective results.

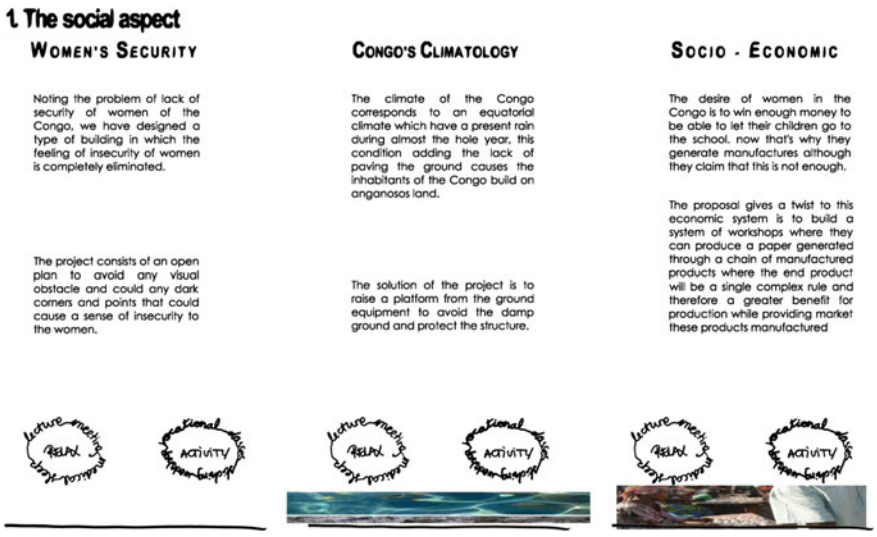

Fig. 5 Examples of concept by one team group (*Source* www.buildournation.org)

Understanding requires a period of orientation that forces students to think and, in thinking, to exercise their critical faculties. When large numbers are involved, the groups must always tackle the problem of creating dynamics able to continually re-establish a balance. This equilibrium inevitably changes with the passing of time. Friedman (2000) states that society is deeply grounded in communication and that a utopia can become a reality only if the number of the members in one group does not exceed a 'critical quantity'. Moreover, one of the big problems that the future generation of architects must urgently address is that mass society is expanding everywhere and exercising one's critical faculties becomes increasingly demanding (De Carlo 2005). BON is not concerned with large numbers, rather patronises a large society of small groups forming and reforming according to the circumstances. This approach can guarantee the iteration of the process not only in the short-term but also in the medium and the long-term.

Stage 2 of TLT. Between Stage 1 and the commencement of Stage 2, the women of Bukavu have been asked to select one of four concepts. These four concepts comprise only one selected concept from each School that differs from the other three due to the provenience (i.e., independent organisation of the team group working in each School), and the selection process (i.e., autonomous self-selection from the multiple concepts of stage 1 in each School). After a process of self-selection of participants, about 30 students from the four Schools worked together in the same place in a two-day intensive workshop. Four new groups of international students initially investigated further variations of the concept chosen by the women; then, all the students together democratically selected the best variation of the idea; and finally they started brainstorming and exploring through models and drawings the first aspects of the now called project for the centre. At

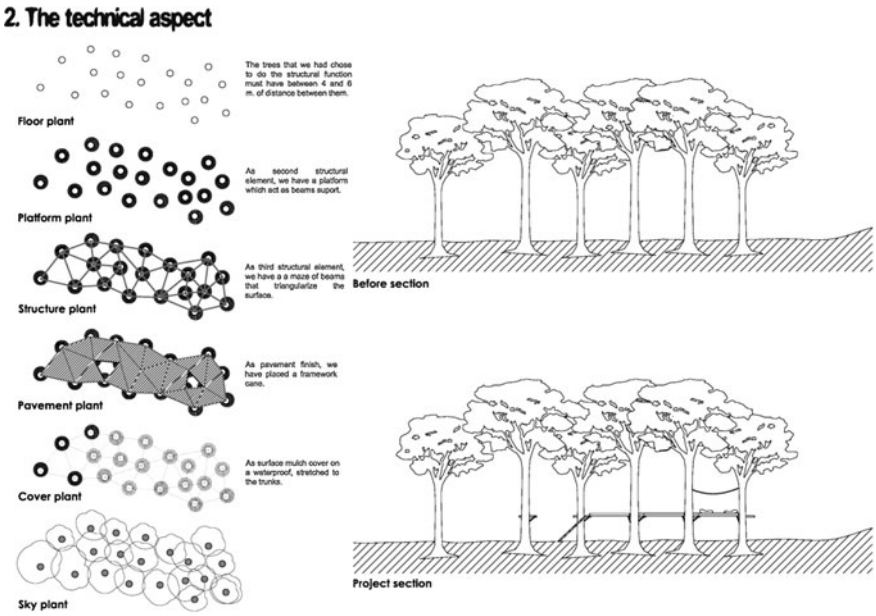

Fig. 6 Examples of concept by one team group (*Source* www.buildournation.org)

this stage, the two-day activities were led by student leaders chosen alternatively from each group who relied on the progression of the work. The role-play regarding interchangeable-leadership gave them the feeling of being a 'chef' dealing with the quality of the ingredients, the storage of them and the preparation of reports. Outputs of Stage 2 included a final report made mainly of drawings and sketches, and a short video on the collaborative design process, created under the supervision of a professional filmmaker who synthesised the entire effort at this stage (Fig. 7).

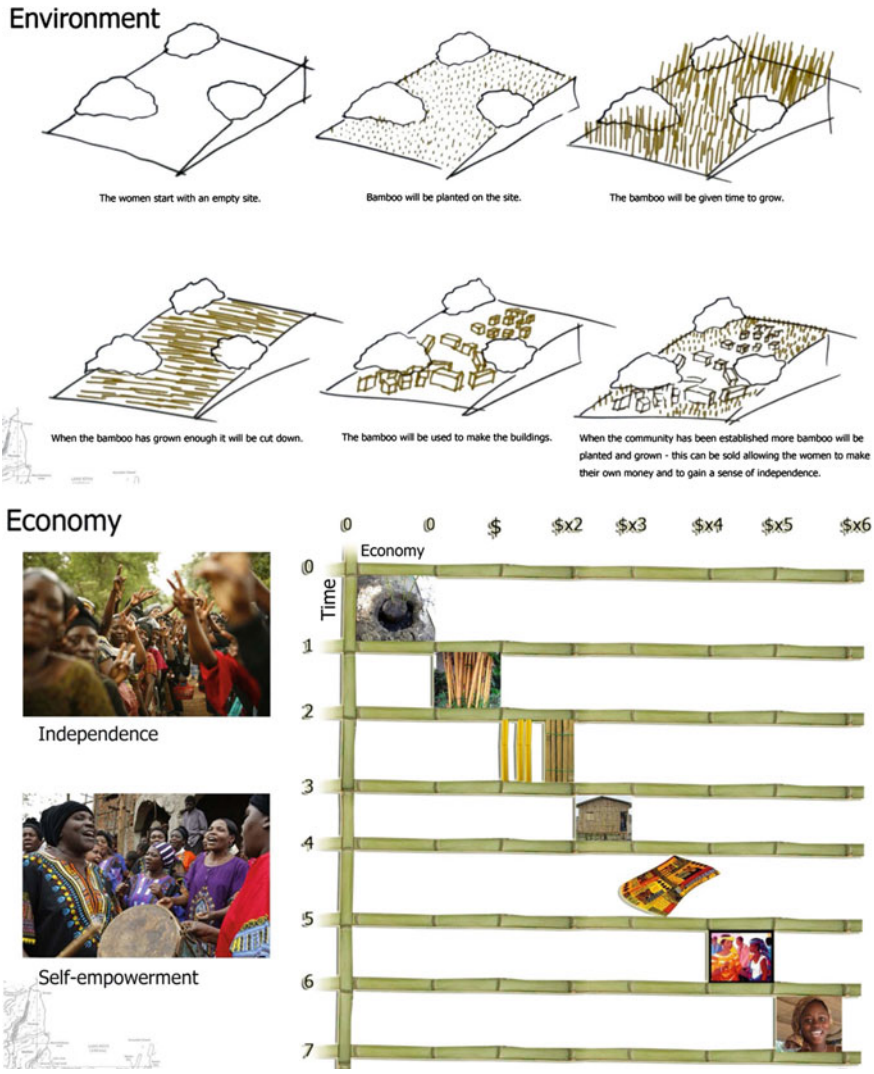

Fig. 7 Interesting results from the final report (*Source* www.buildournation.org)

The use of intensive and short workshops enables students to see and experience the work from a multicultural and internationally engaging perspective. The context plays a critical role in defining the degree of influence the system plays within the contained environment. For example, the easy-to-understand metaphor of cooking is extensively used to make clear to the students that the whole process is a sequence of well-organised stages; but, one cannot just take the ingredients, no matter how good they are, throw them in a pot, add heat, and wait for a wonder to happen. This process should involve a good choice of recipe that tells one which ingredients and in which order they are to be prepared; and only then will the dish taste good when it is served. Price (2003: 87) remarked beautifully: "One sees architectural responsibility avoiding involvement with the whole process. Certainly one can see it in the resulting products, whether they are poorly designed or badly used, or left to stand around too long […]. It is like they should last an appropriate time, just like the storage of food, the preparation, the eating, and the evacuation'.

Stage 3 of TLT focused on the economic and procurement aspects, rather than on 'pure design' issues. The emphasis was on feeling and testing the reality of the project with as close a relationship as possible with the women in Bukavu, the real palimpsest of the site, and the environment of DRC. Building up a stronger link and exchange of opinion directly with the last users has become vital because the first two stages were carried on through the linguistic involvement of a mediator. This process involved dealing with non-verbal communication and with limited economic and technologic resources (Rapoport 1990; Friedman 2003). Both are challenging playgrounds, where the students face realistic constraints and opportunities. Stage 3 was open to a larger number of students compared to Stage 2 (80 in total, 20 from each School). Six groups of students were organised into new vertical units and focused on one specific task (site factors, social factors, technological factors and legislation factors). The entire process was led by various student leaders, who along with the other students, had to deal with an international architectural studio team with a hierarchical structure and to work and to communicate from different locations. The goal was to enhance the general know-how of the actors. It implied 'do it yourself' activities including interviewing professionals about the specific issues of the project to bring in ever new disciplinary expertise as it becomes relevant (Fig. 8).

The possibility of building the first prototype of one unit of the centre in Bukavu is under investigation. That implies the completion of a manual for self-builders in the light of some relevant examples from the past (Friedman 1977) to assess the real women's skills and the student's ability to use non-verbal instructional drawings for building a small mock-up prototype.

Stage 4 of TLT. The on-going Stage 4 focuses on a participatory approach to design, attempting actively to involve the participants in a real international design studio team. In such a playground the participants have specific roles: architects (i.e., students), experts (i.e., staff members and professionals selected by students before the workshop) and real users (i.e., invited women of Bukavu). The objective is to work intensively together in light of the definition of a 'common ground', a process of negotiation of ideas starting from the results achieved by each university

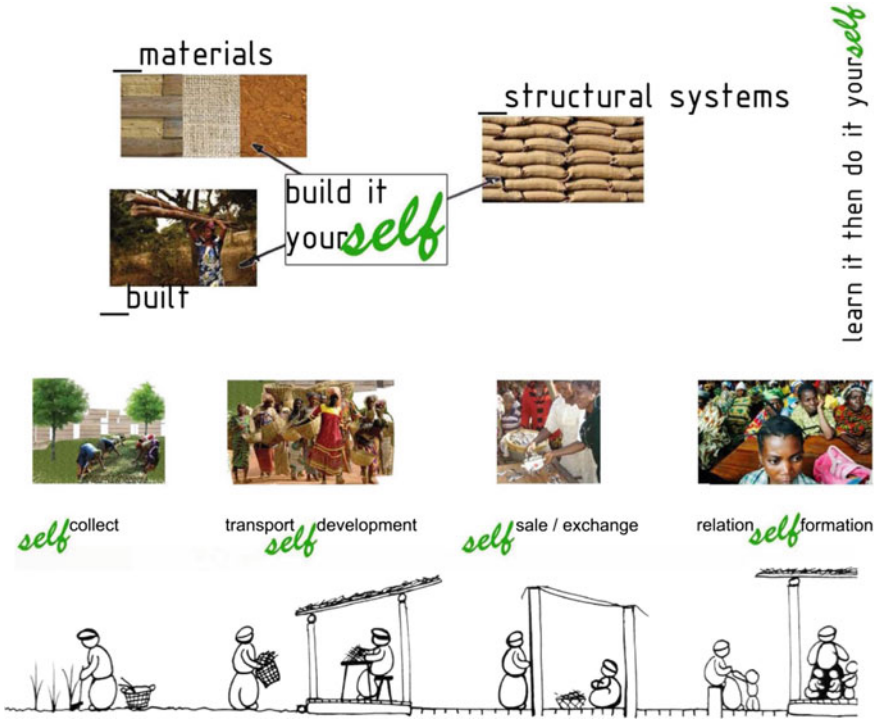

Fig. 8 Self-building process (*Source* www.buildournation.org)

during the autonomous research of Stage 3. This stage culminated in a two-week intensive workshop in the Biennale sessions, the special project of the 13th International Architecture Exhibition, directed by David Chipperfield and proposed for EU funding. The whole process is recorded and illustrated through a web-documentary which includes two parallel frameworks: one on the history of the educational process of BON, and the second on the development of the participatory architectural project of TLT. Part of the web-documentary was filmed in the DRC, where the issues concerning the context, local needs, the challenging participation of the women of Bukavu and some first experimental playgrounds between students (real architects) and women (real final users) were covered. The interactive web documentary (ICT-based tool) supports BON and TLT with a powerful communication platform to promote its experience and share its innovations with a broad audience. The entire process was prepared for the Venice 13th International Architecture Exhibition. The objective was to carry on with this project on a daily basis at the venue to share the outcome with the participants of the workshop and the public of the Biennale in general, who then were able to orient and constantly re-orient themselves in the complex territory of BON-TLT, while finding an individual 'path' in the flow of the workshop.

The specific outcomes of the stages of TLT must be evaluated about the general goals of the frameworks of BON. They have been previously mentioned and identified three target issues: ethical standards and social equity, contextual impact and holistic thinking, and innovation and transferability of knowledge. The conventional rule adopted by the Western professionals underpinned in the ideology that 'any decisions must be culture-specific', turns out to be negative after being assessed in a 'post-occupancy' evaluation. That often happens because of the complex relationships among cultures, behaviours and the built environment. As the territory should be considered a palimpsest, being the results of many overlapping processes and stratifications (Corboz 1985), there are some important social events, footprints, traces, and signs that constitute vital 'latent functions' for designing a new building in its context. In fact, contemporary architectural practice, which tries to identify and allocate the proper time to decipher and to understand and absorb these kinds of 'latent functions', is considered a gadget. BON aims at a general awareness of that problematic issue, which means one additional step in improving the ethical approach to architecture and the built environment. For over ten years Rapoport (2009) has asserted that architecture should be considered a science-based profession, which is concerned with problem-solving rather than a purely artistic activity. Also, one of the principal purposes of rethinking design and building is to create users-oriented environments to respond to their particular culture. This objective represents the common ground for both BON and TLT. Rapoport strongly highlights that designers have to be a kind of 'surrogate for users'. Similarly, BON and TLT encourage the philosophy that architecture must adapt to people, and not the contrary.

First Results: Impact on Architectural Education

The framework of BON and TLT suggest that the process, use of different combinations of certainty, chance, and choice rather than the initial condition, is mostly responsible for future conditions. This implies that understanding the short-term and long-term consequences of an action in its totality requires building a dynamic model to simulate the non-linear nature of the system. By knowing the ideology, it is believed that the models of BON and TLT demonstrate the ability to capture the critical time lags and relevant interactions among major variables. Also for those characteristics, it may be considered an innovative experimental model of *system thinking* in architecture. The two trajectories set as main outcomes, 'rethinking design' and 'rethinking construction', are crossing the boundaries of the discipline towards new scenarios. On one hand 'rethinking design' involves reading and experimental design, exploring and understanding with a 'designing' mind; then planning tentatively, returning continuously to the reading in a mutual alternation which terminates invalid solutions. On the other hand, there is 'rethinking construction' by considering buildings as contextual elements, which means that every building must be considered in connection with its function, users, surroundings,

and the environment because architecture is slowly shifting from a mechanical paradigm to a biological one.

Concerning the first target issue of BON; ethical standards; and social equity, TLT shows us that the formation of human identity can only be conceived as a social process and is triggered by the friction with the 'other'. Direct conflicts with diversity are almost impossible to negate because the formation of any identity awareness is created through the process of comparison, which means that each and every one of us identifies herself/himself through the recognition of what is different (Jenkins 2004; Augé 1995). During the entire research process and through the specific playgrounds of TLT, the students were able to identify polarities of sameness and difference. This space of polarity exists in a social field where everyone is involved in a constant game of comparison and distinction in the quest for self-definition. Ethical standards imply social equity and vice versa.

The second target issue is the 'contextual impact' and 'holistic thinking'. BON states that the real project must convey a high standard of architectural quality in the way it addresses cultural and physical factors without forgetting the aesthetic impact which must not interfere with the surrounding environment. During an interview, Branzi (in Bombaci and Costanzo 2011) says that the aesthetic of the field is the consequence of energies that appear through the diffusion of micro-projects, sub-systems, commodities and services that are managed by design rather than by architecture. In rethinking design, BON capitalises processes that are capable of penetrating into the domestic interstices of everyday life. Additionally, drawing on Bourdieu (1984), Tonkinwise (2011) suggests that the success of a design intervention is often dependent upon its conformability or resonance with existing taste regimes. BON challenges the manner of cultivation of this expertise among young designers, allowing the opportunity to focus on the real capital of *culture*.

The third target issue is 'innovation and transferability of knowledge'. BON has proven to be of enormous interest to students, who have established innovative and lively interactive activities with the other participant Schools. As such, the initiative represents a highly positive learning experience and the kind of extra-curricular activity that would be eligible for the award of academic credit in line with the paper approved recently by Academic Council. The ambition of the group is also to develop its activity further and to mix research with teaching and design. However, these broader ambitions raise some questions BON believes is complicating different institutional plans.

BON believes that *culture* must be proposed as an operating system that guides the social organisation toward predefined temporary orders. Along with the iteration of the process, *culture* is the key to understanding complexity. In the model of BON the shift from *design thinking* to *system thinking* consists in designing platforms that can be used to integrate the iterative approach (system dynamics) and the challenge of self-organisation of socio-cultural systems into a comprehensive system methodology. In particular, the educational framework must change significantly to guarantee an empathetic civilisation for the next generations. Concerning future architects, they should be in the position to meet their needs (Fry 2009).

The following student feedback published at the End of Year Student Book 2011 of one of the Schools of TLT states that in the light of the first results the whole project of BON is already able to show the potentialities of a *system thinking* in design. The authors write: "We can do nothing to change this, so let's do something! […] But the key result and achieved goal of this enterprise were the equipping of future architects in the tools of generative design in a spirit of optimistic realism. If even a fraction of the students in this workshop develops these themes in practice, many more people like the women of the DRC will be helped. One of the most valuable times in my education!"

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When Practice Dictates Change: A New Framework for Architectural Education

Yasser Zarei

Abstract Caught in the crossfire of different approaches arising from the digital paradigm, architectural education desperately requires the introduction of a new framework to guide students to legitimate interdisciplinary knowledge, to encourage them to go beyond the borders of conventional design and to act as a meta-designer who is able to bridge the gap between artistic sense and computational techniques. Traditionally, the majority of architectural practitioners have been mere users of computer packages, restrained by the limitations of the software. As a result, apart from concerns such as the Whorfian Effect (Whorf 1956), creation—the kernel of design—has been drastically threatened. On the other hand, software developers are still striving to present up-to-date platforms that are aware of design requirements. This chapter argues firstly that attaining such platforms is nearly impossible. Secondly, it seeks to look at the dilemma of praxis critically by offering a deeper inquiry into stances of programming in architecture. It argues that if practitioners are taught the appropriate tactics of manoeuvring between knowledge frontiers, the scene of design will witness a new collaboration in which not only a more thorough understanding of the design problems will be achieved, but also the process of design will be defined and executed more efficiently.

Keywords Architectural education · Digital paradigm · Computation · Tool-making

Introduction

Arguably, the current trend of the architectural curriculum is nearly on the brink of extinction. It obliges the introduction of a new pedagogic framework whose rationale hinges upon architectural practice. For many years, architectural practitioners

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have criticised what they have learned in Schools of architecture, arguing that their education is limited, meaning that architecture graduates embark on the realm of practice with fuzzy knowledge and expertise. So why the architectural curriculum is not optimally aligned with practice? This may have several reasons. Schön (1985) argues that for some students architecture is just a form of general higher education rather than professional training. Students select architecture, in the same way, they select art, history, or classics; that is because they do not think of practising architecture. This reasoning remains valid and is also supported by the fact that the number of postgraduate students is decreasing. This may confirm the lack of motivation or the pessimistic feeling about the architectural practice, particularly in times of economic recession. Hence, those graduates prefer to search for other options such as a job in academia, working with definitely manageable problems instead of going deep into the 'swampland' of practice. Interestingly, Schön explains the criterion in universities for being a high-profile professor of architecture is not the design portfolio, but the published papers. Owing to the "complexity, uncertainty, instability, uniqueness, and value conflicts" (Schön 1991) which he refers to like the characteristics of the indeterminate zones of practice, Schön (1985: 4) concludes that in "a period of retrenchment in higher education, schools of architecture would be vulnerable".

The mismatch between architectural education and practice might arise from another issue: the nature of design. Although the majority of the architectural syllabus is focused on design projects, learning design often implies going into a Kafkaesque situation. On the one hand, students cannot learn until they educate themselves. On the contrary, they can only educate themselves by beginning to do; something that Schön explains as a 'double paradox'. In this regard, it is believed that two sets of questions emerge. First, if the nature of design is in the way that cannot be encapsulated within a pedagogic framework, do we essentially need to have design schools? Moreover, secondly, if we accept design schools, why should we consider the practice as an end and not the driving force or even the starting point? The aim of this chapter is to reflect on these questions and to see architectural education through the lens of computer science. Also, it is argued why a new generation of architect-computer thinkers should be trained in schools of architecture.

Design Requirements and Computer Programs

The nature of design problems has been investigated extensively by researchers of design methodology (Archer 1984; Jones 1984; Lawson 2004, 2006). Perhaps the terms 'ill-defined' or 'wicked'[1] have been the bottom line of such attempts. For

[1]A wicked problem is a state of social or cultural problem that is difficult to solve because of its inherent nature of incomplete, contradictory, and changing requirements., such as, poverty, sustainability, equality and health and wellness (Margolin and Buchanan 1996).

instance, Rittel (1984) discusses the structure of the problems (of what, designing in light of practice is) to address the main purpose of design methodology. Looking at the sociological dimensions of problem solving, he argues that people like a solution, if they have been involved in its generation. Rittel (1984: 323) mentions that design—in the sense of forming judgments—can never be simulated by a computer; "Because, to program that machine, you would have to anticipate all potential solutions and make all reasonable deontic judgments ahead of time before the machine could run". However, Rittel also argues that by using a computer, the quality of design will be better. In another paper, Rittel and Webber (1984) attempt to take into account the features of 'wicked' problems. Their explanations perhaps depict why computer programmes often fail to address an accurate account of design requirements. Wicked problems usually exist in social professions and are completely different in essence from the 'tame and benign' ones in science, rejecting any definitive formulation or stopping rule. Practically, this means that the endpoint hinges completely upon practitioner's intuition and satisfaction. In short, working through a wicked problem is a problem itself. Another quintessential thinker, Rowe (1987) in his intriguing book *Design Thinking*, explains the problems associated with the process of design. Rowe's work is valuable due to it scrutinising the process of design through doing an ethnographical investigation of three case studies. Although Rowe (1987: 77) attempts to see the design process through rational concepts such as the 'decision tree', he highlights that the design process is "a sequence of episodes or situations that are, in turn, coincident with periods of heuristic reasoning through which problems are defined, and solutions sought […] Between episodes, control is relinquished". Similarly, Schön (1991) defines design as a reflective conversation with the design situation. Cross et al. (1996), Cross (2001, 2006) considers the design activity as a unique phenomenon that demands its approach. Most of the methodological standpoints in design often emerge from purely artistic or fully rationalistic scientific approach. Therefore, design cannot be explained in a meaningful manner. Design requires a 'designerly way' of thinking and understanding. Arguably, it needs an in-between voice among these 'two paradigmatic stances' (Dorst and Dijkhuis 1995).

The computer industry seems unable to understand this unique aspect of design. Failure of all the attempts at making more and more sophisticated platforms is because all of the systems often benefit from a purely rational approach in shaping the structure of the programmes. So how can the software developers make a positive contribution to this situation? The solution is two-fold: either to present a platform based on a designerly way of understanding the design problems which although theoretically might look feasible, is somewhat inapplicable due to the complex challenges in the design methodology, or to shift the pressure from the tool to the designer. The latter solution seems more feasible besides its strength to dictate significant changes in design pedagogy. Fortuitously, the body of global architecture benefits greatly from avant-garde architecture schools. Some of them, like the Architectural Association (AA), have for several years already started to move toward this approach. In another sense, this probably shows that avant-garde

architectural practices also demand a new generation of architects who are capable of thinking beyond the available programmes and to act as a computer scientist-designer. Schumacher (2011: 138) who has been both the leader of the Architectural Association Design Research Lab (AADRL) and the partner of Zaha Hadid Architects (ZHA) for several years explains in his book, *The Autopoiesis of Architecture*, that schools of architecture should become 'labs' in two distinct ways: first, "to scan society to find architectural problems and define briefs even if no client has yet articulated them. This updates the agenda of architecture and thus helps architecture to anticipate challenges rather than waiting to be pushed by a client. Secondly, to chart potentials that might inspire the search for problems by discovered 'solutions'".

Current Stances on Computational Design

The present use of computation in architecture is entirely attached to the digital realm and particularly computer programmes. Nevertheless, 'natural computation' was a method employed by some architects like Antonio Gaudi or Frei Otto, who focused more on form-finding methods in design. For many architects, the computation may conjure up an image of rationality. Thus, they would probably harbour the inappropriateness of a computational framework vis-à-vis the design activity since for many architects design is an irrational process dealing with many unpredictable situations and contingencies. Among architects, computational techniques often resonate with younger generations of architects. Apart from the common belief among architects that computation carries an inner rationality, some other issues may question the influence of computational approaches in design.

First, all of the terms used to describe computation often create an amphibological or dubious state when designers come across the word 'design' in one phrase. For instance, the term 'parametric design' reflects a semantic paradox. Etymologically, the adjective 'parametric' refers to a parameter, which originates from the Greek 'para', meaning a subsidiary or beside and the word 'matron', which means 'measure' (Oxford English Dictionary 2012). The parameter is a measurable factor that defines a system or sets the conditions of its operation. Generally speaking, 'parametric' can be defined as something precise. Alternatively, the meaning of the word 'design' is diametrically opposed. While its origin comes from the Latin word 'designare' which means 'to designate' (Oxford English Dictionary 2012), it often implies an unpredictable or uncertain activity dealing with quite 'ill-defined' or 'wicked' problems which in turn stress the impossibility of definitive formulations. Likewise, 'algorithmic design' brings similar connotations. Whereas the root of the word 'algorithm' refers to Khwarizmi, a Persian Mathematician, who first invented a method of calculation, 'algorithmic' is often explained as a process of setting rules in a problem-solving context. Finally, probing into the etymology of computation brings the same paradox. The word computation is a derivative of the word 'compute', which means to calculate.

It stems from the French 'computer' or from Latin 'computare', composed of the prefix 'com' which stands for 'together' and 'putare' which means to 'settle (an account)' (Oxford English Dictionary 2012). In a nutshell, all of these three terms—parametric, algorithmic, and computational—essentially resonate with a voice of regularity, while design reflects the opposite meaning.

The lexical contradictions show that for any investigation on the position of computational design, researchers should address two bodies of research; one which relates to the digital domain arising from technological advances and the other which explores the methodological issues regarding the design activity. On the level of general inquiry, how might digital technology be adopted in the architectural design methodology? To what extent does computational design offer a methodological standpoint? Both of these questions remain broad; perhaps because the realm of the digital is itself vast. This might be the reason why some scholars have called the digital a paradigm or more accurately a paradigm shift. If there is a change, others like Carpo (2011) ask the valid question: 'which paradigm is shifting?' Accordingly, the vagueness of the digital realm enforces its reduction into two positions: digital technology as a context with cultural or sociological issues in liaison with architecture, and digital technology as a collection of different tools being used in the design process, playing an epistemic or ontic role. Researchers in the first category have sought the impact of the digital realm of architectural design by looking at architecture through an interdisciplinary lens or a macro level of inquiry (Carpo 2001; Carpo and Lemerle 2008; Houdart 2008; Latour and Yaneva 2008; Picon 2006, 2010; Yaneva 2011; Guy and Karvonen 2011). The other group of scholars has focused on the role of digital tools when they are added to a part or the whole of the process of design to supply an action or enhance a capability of practice. This is a microscopic view that investigates the details of the design process critically to uncover its shortcomings by considering devices such as the digital pen and paper or software packages (Suwa and Tversky 1997; Knight et al. 2005; Koutamanis 2005; Darses et al. 2008; Dokonal and Knight 2009). While this bifurcation like the digital-design relationship may yield some implications on the development and even the invention of new digital tools as well as investigations on the epistemology of these objects in the macro context of the digital, the more relevant argument revolves around how the computer can promote design methodology. So far there have been few attempts to use computation as the primary driver of design methodology due to some reasons. However, surely the most important reason, as mentioned in the previous section, is the complex nature of design.

Another ambiguous stand of computation apart from the challenges of its adoption in design methodology is its practicality per se. It could be said that, similar to design, computation is still struggling with its dilemmas. Through a 'designerly' point of view, for many architects, computation is often confused with other terms such as computerisation. Computation often implies a procedure of calculation by mathematical or logical methods. By contrast, computerisation involves the act of processing and storing information in a computer programme. It is more about digitisation and automation of something often well-defined (Terzidis 2006).

Computation in a simpler form refers to "a system that processes information through a discrete sequence of steps by taking the results of its preceding stage and transforming it to the next level by a recursive function" (Chu 2006: 40).

Computational techniques are necessary to consider about architectural practice for several reasons. For the most part, computation is an efficient vehicle in exfoliating those architectural concepts that previously remained only in the architect designers mind. Some companies might choose this approach in order to stay in competition with others. To see it more clearly, the two camps of designers, the avant-garde and the mainstream, are worth considering further. While investment in computational techniques is high on the agenda for avant-garde architectural offices like ZHA, mainstream practice is more ambivalent in its engagement with computational techniques. Still, the use of computer programmes in the majority of companies is often deemed as a gossamer veil on the traditional pen-and-paper design. For the architects who are moving towards computation, they assume that the design is a process of calculation of the conventional representation and is undesirable.

A current research project being undertaken will now be discussed due to it being considered a litmus test of issues relating to computation in architectural offices in Manchester. The study has a random selection of Manchester-based architects. They were asked to explain the advantages and merits of parametric design as well as its challenges and pitfalls. Regarding the advantages, architects referred to some distinctions of parametric design in comparison with conventional design and traditional CAD such as the capability of setting relations between objects of design, setting constraints and in general a better engineering of the design process. In contrast, several challenges were mentioned. While some of the architects discussed the problems such as cost and the availability of parametric programmes and also some organisational pitfalls such as the size of the company, others stressed issues like restraining the architect's creativity by parametric software and in particular the problem of authorship. The last issue is a serious concern in the entire body of computation because designers have always been the sole owner of their design. In all of the computational approaches benefiting from algorithms, "anonymity goes counter to authorship" (Carpo 2011: 43). These challenges make a bifurcation in the role of the designer, vis-à-vis computer tools. While the majority of architects are still tool-users, there is a group of architects who are more computer-literate. According to McCullough (2006: 15); "The crafts of personalising one's workspace and scripting one's intellectual pleasures have become far more distinct in the generation of designers who grew up with computing". Having gained the knowledge of scripting and programming, the computer literate architects are more capable of joining different programmes by going deeply into the level of computer syntax. This task liberates the designer from knowing how to use different software packages. Instead, these computer literature designers only need to know one programming language that supports all of those packages. A recent graduate of Manchester School of Architecture (MSA) says:

> I would suggest there is a younger generation coming through who are simply more computer literate. They can operate code, and do not need to be limited to existing software; we can build our own. This is not just happening in architecture, this is happening in many creative disciplines and is being progressed by open-source initiatives and blog culture […] different platforms normally have scripting capacity. So what you can do from here is you can write a list of services that allow you to be connected to the software […] I can create a script that perhaps creates some geometry here and it then sends the information back […] then create the same geometry in a different platform […] (So) what I am doing is rather than creating from inside a package, I am operating from the outside in an open source programming manager and then I am […] hacking into simulation software, hacking into form generation things like 3DS MAX […] I like the freedom is of using code to build and create my own tools. (Interview with D.R, 08.11.2011)

Many lecturers in architecture present the same position. Roland Hudson, Architecture Professor in Dalhousie University, Canada, who has worked both in academia and practice and managed several workshops, argues that software packages never meet the design requirements because the nature of design is unpredictable. He explains that designers should not sit and wait for the software to be available. Instead, they should learn to make their tools:

> [Software packages] will never meet the designer's needs. The designer needs a toolkit of parts that can be customised and extended according to the needs of a project. No piece of software can anticipate these requirements. The designer needs to be a toolmaker, and the software needs to support this. (Email-interviewing with Dr Roland Hudson, 19.10.2011)

A more pragmatic, yet elaborate, approach towards computation involves discovery in design, going into the unpredictable realm of possibilities, engaging with creativity. The current software packages in design are not creative tools. A genuinely creative tool, as Aish (2011: 27) explains, is one that when used by a perceptive designer, will be able to create results beyond those envisaged by the original software developer. This is again a paradoxical position in tool-making. How can the software developer provide such a platform? Designers should think beyond tools and become their tool-maker, not be restrained by tools.

Tool-Making and Architectural Pedagogy

Although proposing that the architectural designer as a self-tool-maker may discourage software developers to scale down their lucrative industry, such stances towards computation are nothing short of a change in architectural pedagogy. Without question, tool-making demands a vast knowledge of programming and scripting. The best way to hone the scripting skill is to extend theoretical understandings and to practise and experience more and more. However, the challenge is that architecture students must have the proper ground of training. For instance, they should be knowledgeable in mathematics to be a competent programmer. Unfortunately, CAD courses in academia so far have alienated students from mathematics. Scheurer and Stehling (2011) discuss that looking at the curricula of

architecture schools shows the replacement of the 'uncreative formal rigidity' of mathematics by CAD courses based on this idea that somewhere in the background the software would consider all calculations. Therefore, tool-making clearly requires the revival of mathematics in architectural pedagogy. Also, it seems that one reason why computation has not been fully engaged in design practice is that most designers think of two extremes rather than an in-between standpoint. While the traditional techniques and design with pen and paper occupy one side of this duality, the given computation is revealed as the opposite side. Thus for operationalising a computational strategy in architectural education, an in-between stance towards computation seems crucial. According to Derix, the starting point of this in-between stance is 'unlearning' what has been learnt either at university or in the individual projects. Derix (2009: 567) believes that "true computational design must sit in-between the two fields [computational science and architectural design] and therefore demands new standards for design thinking, its professional workflows, and the use of algorithms".

Tool-making in one sense can recall the notion of 'meta-design' or 'designing a design' in architecture, which has been previously explained by the theorist Bill Hillier. However, through the computational lens, meta-design entails a shift from software developers to software users to create and contribute their visions and objectives. According to Fischer et al. (2004), the primary aim of meta-design is to provide socio-technical environments that give users the power of active engagement in the continuous development of systems rather than being restricted to the mere use of the existing ones. As such, a condition for software is the consideration of features, permitting users to generate complex customizations and extensions. "Rather than presenting users with closed systems, meta-design provides them with opportunities, tools, and social structures to extend the system to fit their needs" (Fischer et al. 2004: 36). Another advantage of a meta-design approach is its cost-effectiveness. Fischer et al. (2004) argue that this is particularly the case for the open-source projects. Because the development cost is distributed among a large number of participants, it imposes a lower cost on making the initial platform. Meta-design also implies another strategy for software developers. It requires more abstract tools rather than an elaborate, sophisticated platform. Aish (2011) argues that such a strategy demand a deeper understanding on the part of the designer. Aish (2011: 23) mentions that "Concepts and technologies initially created and applied at one moment (at time t) are often subsequently used or interpreted in radically different ways (at time t + n)". So if one takes into account architectural design tools as "the discourse between the systematic and the symbolic, then computational design tools can be described as an equivalent discourse between the abstract and the intuitive" (Aish 2011: 23). Hence, making the initial platform as abstract as possible can help the designers extend towards their personal goals with their insight and intuition.

Clear evidence which emphasises the necessity of tool-making and its consideration in architectural education is the complexity of the current software packages. For instance, Rick Smith's observations in working with CATIA Version 5 and Digital Project parametric modelling software within Gehry Partners and

customers of Gehry Technologies who purchased Digital Project shows that those platforms have resulted in decreasing the speed of design and increasing cost when compared to the earlier processes and conventional tools. As a result, and in regards to parametric design Smith (2007: 6) proposes that "a new breed of architects will need to be trained. They would need more rigorous discipline, not only in understanding three-dimensional geometry but also in the discipline of software programming and architecture".

Finally, tool-making can also remember the cycle of 'homo faber homo fabricatus' (Terzidis 2006) where the human makes a tool and the tool makes human. The way of making human changes the way of thinking which is incorporated in the next generation of instruments and in turn that will influence the next generation of designers and so on and so forth. This extreme stance shows the importance of academia to provide a pivotal point for breeding the next generations of architects. Tool-making must be seen as the overarching aim, dividable to several pedagogic objectives under the auspices of architectural practice. This would be the best way of stepping towards a meta-design approach in architecture.

Conclusions and Recommendation

This chapter aimed to furnish architectural design with stances of computation to explain why a new pedagogic framework in architecture is essential today. Schumacher's (2011: 139) argument that "the idea that academia itself could establish models of best practice is utterly misguided" seems supportable. It is argued here that instead of a deductive strategy that first assumes theoretical construct in education, we should concentrate on an inductive scheme coming out of practice, a project requiring further research. There is a need to map the current state of the Schools of Architecture regarding their computational perspective. The necessary pedagogic framework should be established on this map to align with the use of creative computation in practice. To breeding the new generation of architects, attention should be focused on two standpoints: firstly, enrichment of student knowledge in programming and scripting. This demands not only focusing on computer science but also the introduction of applied mathematics modules as some options along with programming modules. Secondly, bearing in mind that the realm of practice is an indefinite and uncertain land, students should learn how to do a meta-design to tackle real design problems.

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Recycling the City: A New Pedagogical Approach to the 21st-Century City

Rosa Cervera

Abstract One of the major difficulties that humanity currently faces is how to build the cities of today. The exponential and spectacular growth of demographics, the usage of resources, and widespread consumerism have rendered ineffective the architectural models practised in the past. Given this situation we must ask ourselves, what is the role of academia? More specifically, what is the role of architectural education? Many types of architecture are already excluded from the academic educational agenda. Architectonic splendour over the last few decades has added to the brightness of a prosperous segment of society, and it has meanwhile shadowed and hidden the large urban and architectonic downturns that now require attention. The Design Studio of the "University Master in Advanced Project in Architecture & the City" (MUPAAC) offered at the Alcalá University (Madrid, Spain) tackles "urban systems" with the purpose of building "efficient urban cities". These cities need to balance human, social and environmental parameters, and this is how the concept of "Recycled City" came into being (Cervera Sardá 2011). However, can a city be recycled? The core concept of "Recycled City" inherently carries the idea of intervention into the existing city, with the intention of adapting it to contemporary demands. To recycle a city means to build "towards the inside" and to consider it as something that is "alive". Several boroughs in the city of Madrid have served as models upon which work based on the concepts already described has been done. The results have been groundbreaking from a better balanced social habitability and a more sustainable and efficient use of energy.

Keywords Recycled city · Re-using cities · Sustainability in neighbourhoods · Architectural education · Dynamic cities · New urban pedagogical approach

Currently, one of the major difficulties faced by humanity is how to build the cities of today. The exponential and spectacular growth of demographics together with

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the over usage of resources and widespread consumerism have rendered ineffective the architecture model/standards practised in the past.

As we consider how to approach the design of our contemporary cities, we must first ask ourselves: What is the role of academia? Moreover, more specifically, what is the role of architectural education? This is due to the reason that many types of architecture are already excluded from the academic educational agenda. Architectonic splendour over the last few decades has added to the brightness of a prosperous segment of society, and it has meanwhile shadowed and hidden the enormous urban, and architectonic downturns now require attention.

Over the last few decades, architects have been recognised for producing a range of magnificent works internationally recognised as social icons. This type of architecture has reflected a period of abundance and well-being throughout a time of change spanning the late 20th century and early 21st century. It has opened up an important path of investigation of form and spatial parameters. Architecture has been made widely known through the usually specialised channels as well as mainstream media, thus amplifying the belief that the objective of architecture remains solely but falsely within the creation of this type of remarkable buildings.

While architecture was buoyant, our contemporary cities were following their course. The multiple forces that influence urbanism was shaping the contemporary metropolis. The real authors of this rapid urban growth were some anonymous social agents amongst which professionals of urban planning, with architecture and engineering backgrounds amongst others, were undoubtedly present. During the last few decades, the "Architecture as Object" concept has been widely diffused as opposed to the idea of "Architecture as a whole" as this has not been considered equal or socially relevant. This has had an undeniable influence in the academic world and on architecture students, who have concentrated most of their effort on developing the ability to design at the scale of the building, with the aim of emulating the remarkable works replicated ad infinitum by architecture magazines worldwide.

However, the situation has changed drastically in the last few years. The overwhelming "urbanisation" process currently suffered by the planet is the result of both demographic growth and the desertion of rural areas taking place around the world. Consequently, we now find that our main subject is the life of "the city".

The design studio of the "Master in Advanced Project in Architecture & the City" responds to these contemporary global developments understanding that imminent and drastic change is heading our way. We have decided to tackle it head-on by exploring present urban systems with the purpose of building and/or transforming them into "efficient urban cities". These are defined by their desire to achieve a balance between human, social and environmental parameters, by revising old design concepts and proposing a new approach of using the existing resources to produce the "Recycled City".

So can a city be recycled? The core concept of "Recycled City" inherently carries the idea of intervention into the current city with the intention of adapting it to contemporary demands. However, to recycle a city means to build "inwards/towards the inside" and to consider it as something that is "alive". Given

today's perspective regarding the limited global resources of our planet, we must demand a revision of the parameters and variables that used to shape architecture and urban structures at the end of the 20th century.

Several boroughs in the city of Madrid have served as models upon which work based on the concepts described above has been completed. The results have been groundbreaking from a better balanced social habitability and a more sustainable and efficient use of energy.

We have been working with a broad and diverse base of urban schemes with an aim to encompass the widest possible range of situations and confront them from some different perspectives. We present here proposed interventions into three distinct urban settings so as to offer examples of like what a novel approach to teaching architecture might appear. Two of these areas are located centrally within the city of Madrid, and a third is in the surrounding suburbs. The first two explore vastly unlike cases. The first, Salamanca, consists of a deeply consolidated high-end social standing borough with superb quality architecture; and the second, Tetuan-Valdeacederas, consists of an irregularly shaped area populated by residents with a more modest economic status and immigration settlers, which initially was located on the fringe of the city and now has been engulfed into a privileged zone. The third example is Alcalá de Henares, a city in Greater Madrid. The transformation of this city is analysed throughout its long historical journey from its time as the capital's industrial zone in the 1960s, through to when it lost most of its productive activity and to the present day. It has now redefined itself as a university city with the touristic appeal. It is also used as a dorm borough.

Salamanca: A Model City?

This borough of Salamanca is one of the finest examples of nineteenth-century urban expansion. Right from its very origins, it was configured as a settlement for the middle and high-class bourgeoisie. This higher end class resident has held to date as it continues to be the chosen area for financial institutions; companies' head offices and top fashion firms that coexist with a settled middle class. So we might ask why are we proposing an intervention in the Salamanca district from the conceptual framework of the "Recycled City"? Considering the facts one might think it unnecessary to intercede in an area considered a model zone. There are many reasons. However, that elevate it to the status of an ideal city and a constant point of reference. Some of these are urban density of 280 habitats/hectare; a regular chess like street layout characteristic of a thorough widening plan design; its noble architecture; and the prominent citizen activity, amongst many others.

However, when we decided to put forward this area for intervention in the design studio, it was because we had the feeling that underneath the appearance of coherence and perfection exuded by the district there lay some incoherencies that had not yet been confronted. These were the outcome of a lack of adjustments that were preventing its modernisation and adaptation to the needs of a balanced,

efficient habitability suited to the 21st century. In effect, we asked students to engage with the cities from "inwards/toward the inside" by regenerating not only that upon which consensus of degeneration has been reached, but also that which is held unanimously as in bad quality. This was a tough challenge for the students.

The original Widening Plan known as Castro's Plan was designed by the engineer, Castro (Aparisi Laporta 2004). Initial analysis by the students noted that Castro's Plan had been faithfully followed when operating on the level of the readily visible i.e. at street level. However, most of the areas inside blocks had been negatively affected by a streaming process of appropriation and over concentration in the interior spaces. Where a permanent and aggressive occupation of the free spaces within blocks and urban interstices occurs, there are not one but two negative repercussions. On one hand, edification margins soar and become much higher than those originally planned. This results in an overall impoverishment in the building quality and the quality of life. On the other hand, there is a marked lack of free zones and green spaces (Fidalgo García and Martín Espinosa 2005) (Fig. 1).

The high-quality facades lead us to believe that an overall quality runs through the whole built fabric. However, to some degree, these facades are just a great curtain to keep up appearances. The development of the Borough of Salamanca was characteristic of the nineteenth century in that the "dressing up" of architecture with ornamented facades was a form of social expression as well as a means for financial profit and speculation. A strictly correct architecture shaped by rectilinear streets, geometrical blocks and lavish uniform facades speak to us in sharp contrast to a whole rear side world of low-quality architecture filled with irregularities in their construction (Fig. 2). Although an equal protagonist part of the block, this side

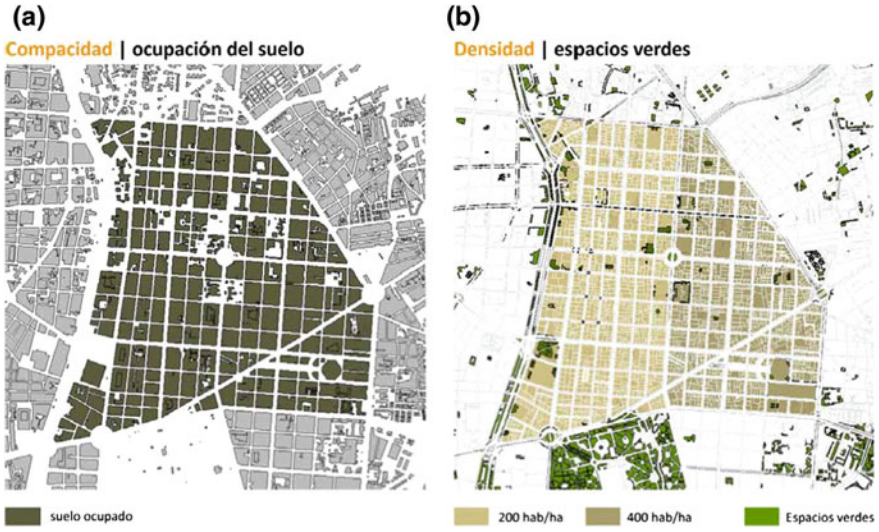

Fig. 1 Salamanca general plans: **a** Ground coverage layout. **b** *Green* spaces layout. Note the interesting densification development in the district (*source Digital Atlas of Urban Area, Ministerio de Fomento, Spain* 2012)

Fig. 2 Typology blocks, high quality outer facades and rear inner facades (*source* Author 2012)

becomes "invisible" as it has nearly nil access for the unsuspecting pedestrians who stroll through the elegant streets in front. It is this duality between the characteristics of the front and rear sides that we get the feeling of unease and disruption in the Borough of Salamanca; especially if we take into account, the habitability conditions required in the 21st century.

Reinventing "the Block" by Introducing Nature

It hardly comes as a surprise that some of the design responses by students compensate for the scarcity of green spaces, achieved through interventions that incorporate elements of nature inside the densely built area. A particularly interesting alternative was elaborated by Alberto Maletti. He proposed the creation of a new structure placed above the reticular grid in Castro's Plan. This new structure is modelled on a link network such as that of the neural system and acts an alternative communications arrangement in the borough that connects blocks through an

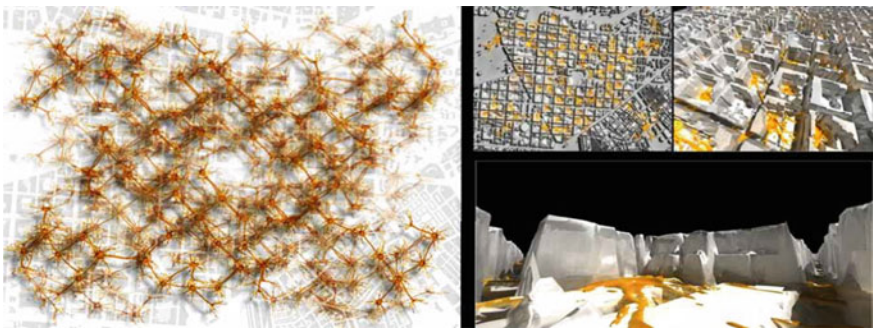

Fig. 3 Neuronal net is conceptualising in the urban space (author: Maletti 2012)

Fig. 4 Spaces inside blocks are becoming gardens open to citizens (author: Maletti 2012)

ensemble of green "vacuums" (Fig. 3). This novel organising system that mirrors a film negative of streets and the reticular grid appropriates itself in the existing spaces inside blocks and conquers these areas by transforming them into landscaped gardens open to citizens. From these liberated spaces, a new concept of three-dimensional landscaping that occupies both horizontal and vertical surfaces is born (Figs. 3 and 4).

This intervention implies a revision of the concept of blocks. After incorporating a vast amount of urban surface that was previously hidden and excluded from the city, the main street ceases to be the only alternative for pedestrians. By taking better advantage of city spaces and improving the quality of life, this urban fragment is being recycled.

A New Household for a New Way of Living

Most borough inhabitants first had access to their dwellings a long time ago and had been residents for decades. As a result, this population group has now aged, and households are typically made up of a small number of family members that occupy large size flats. This takes little advantage of the built space in the city, leading to an adequate situation that does not meet contemporary housing needs for "efficiency" (López Díaz 2002). These households typically meet the standards of living modelled by nineteenth century and early 20th-century bourgeois. They stretch between 200 and 500 m^2 and have several poorly lit by natural light rooms without ventilation. These conditions are inadequate for 20th-century tenants and inefficient for the city occupants of the 21st century.

Initially designed to be used by traditionally structured families with several children and maids, these households are presently inhabited by family units made up of a single member or an elderly couple where housemaids no longer stay

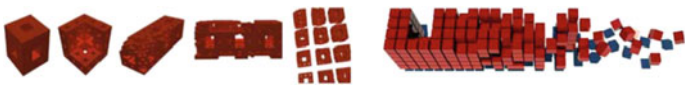

Fig. 5 Understanding blocks in the way of fractal volumes: decomposition and disintegration (author: Ochoa 2012)

overnight. We find that a considerably large built space is not being fully utilised, and this is an extravagance that contemporary cities cannot afford.

Some of the proposals by students focus on revisiting the configuration of blocks in search of alternatives for housing allocation appropriate to new living styles. The proposal submitted by Jorge Ochoa (Figs. 5, 6 and 7) reconstructs the urban space by introducing a single unit as a basic prototype upon which a variety of housing styles could be based. In this proposal, by beginning from the single household, we arrive at the urban space with an aim to promote healthy coexistence amongst diverse generations, diverse models of family and cohabiting styles. The second step reinterprets the concept of vacuum from a three-dimensional perspective.

Fig. 6 Single unit as a basic prototype for a variety of housing styles (author: Ochoa 2012)

Fig. 7 Proposal for inner spaces in blocks (author: Ochoa 2012)

By understanding blocks in the way of fractal volumes, a game between built and yet to be built spaces is created, and it yields an attractive sponge-like expansion of the concept of patio throughout the entire building, introducing light and green areas. This gives way to a new definition of volumetric built space and hence of the blocks. Citizens can walk through this scenario made up of filled and empty spaces located at different levels and feel that the block's interior zone is just like a new exterior façade. The duality between the front and rear sides or between what is shown off to the city as an example of magnificence and what by being left unseen respectively is usurped, and the concept of a dubious backstage is abolished.

The range of household types that derive from just one prototype is a real success. It evolves and combines itself into living in units for single people, for young childless couples, for traditionally structured families, sharing students, two families that share accommodation, temporal tenants or floating population, and so forth. This proposal intends to answer the current social housing reality in Madrid. As is customary in all previous projects, running through this whole proposition process from its conception up to its development in every urban and architectonic detail, particular attention is paid to climatic conditions, energy savings, the introduction of nature, and an improved maximised way of exploiting built areas.

An urban lab for the unplanned city outskirt: Tetuan-Valdeacederas.

Tetuán was born as an outskirt unplanned borough at the beginning of the 19th century. It was located on the periphery of the city and became the main entry road to Madrid from the north of the peninsula. This peripheral settlement has had from the very beginning an irregular morphology characteristic of unorganised or unplanned settlements. The lack of organisation is accentuated by the area's uneven topography, which includes large folds in the territory and steep hills and slopes. This forces the territory to be compartmentalised to adapt to topographic variations, land ownership and sale-related plot divisions and subdivisions. Clearly, the situation hardly amounts to a planned and coordinated operation for the occupation of a territory. These factors have forced Tetuán to remain at a low economic level despite the growing expansion of Madrid in that area of the city and despite also its privileged high and salubrious location with spectacular views towards the Sierra de Madrid (Madrid's mountain range).

As a consequence, this fragment of the city of Madrid has been left inside it like a bubble that holds certain ghetto connotations. Its population consists mainly of local elderly inhabitants who share the area with young immigrants originally from Latin America and all generally of a low-level income. This mixture means a significant disparity in homes. Some households are inhabited by just a couple and the remainder by a couple with one or two children. Aside from these more or less conventional family units, we also find homes for singles; homes shared between two families, and homes shared by 10 or more residents who are not related to one another. The obvious conclusion derived from this research is that the traditional housing planned for conventional family units of three to around five members cannot solve the present needs of current borough residents and that proposals for new residential typologies are required. It would also be desirable that housing legislation becomes flexible enough to include new coexistence models (Fig. 8).

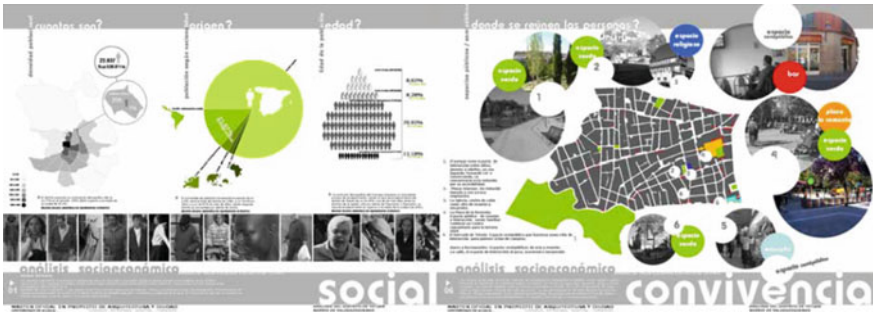

Fig. 8 Demographic and social analysis (*source* Author 2012)

Generally speaking, the whole borough is of low architectonic value and lacks any unique or monumental building so the urban landscape is not particularly attractive. Likewise and despite the presence of low-height buildings in certain zones, the overall appearance is congested and excessively assorted with very narrow streets where the sun can scarcely enter throughout the year and even less so during the winter.

Moreover, moving on to greener issues, the lack of open and green spaces in the borough should most definitely be addressed. The Council did introduce a large park in the western fringe although sadly it is not easily accessible as it is located in the lowest zone of the borough and a steep slope separates it from the urban areas. This means that the residents, such as the elderly and parents with children that are more likely to make daily use of the park do not visit it due to the lack of accessibility and the distance to travel to it. Moreover, as a result, this geographic zone has no real public spaces or green areas for recreation (Fig. 9).

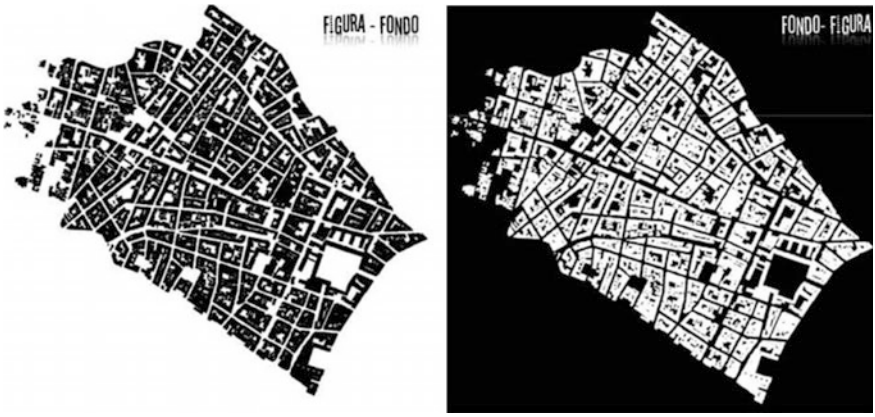

Fig. 9 Built—Vacuum analysis (author: Zamudio 2012)

In summary, the most critical observations of the borough made by the students are the following: the brisk changes to potential building scales; empty spaces inside buildings that are not being fully utilised that have often been seen to be misused; diversity and incoherence of architectonic typology and aesthetic language; self-made architecture in the most degraded zones; lack of alignment when building streets; lack of natural light and green zones within the urban space; a feeling of chaos and urban mayhem; lack of maintenance, and so on. All these are determining factors that devalue the borough despite its great location within the city and its favourable environmental characteristics. These are all reasons why the area becomes affordable to low-income populations, overseas citizens, and so on.

Recycling the City

One of the prevailing risks of marginal boroughs in the major cities is their tendency to form ghettoes that become isolated pockets inside the city. Urban and architectonic design can be a powerful instrument of intervention in the marginal city. Adequate construction, the improvement of urban spaces, and the provision of appropriate infrastructures and services, can all be critical to the urban restructuring of an area. We are also convinced that by providing an adequate and dignified architecture, the citizen is also dignified.

Following previous analyses and crosschecking of data obtained by students they arrived at the following general conclusions:

(a) The borough of Valdeacederas provides ample opportunities for our base concept of "recycling the city". It is situated close to one of the highest valued areas in Madrid, over a top spot with panoramic views and clean air. An altogether integral rehabilitation of this zone would allow for a better distribution of population density and would furnish the interior with green and open spaces. Additionally, an integral rehabilitation plan would enable the improvement of existing infrastructures and the option of implementing sustainable energy and mobility models.
(b) The Valdeacederas Council lacks an integral rehabilitation plan and seems to ignore the surge of habitability problems such as the modest resources of the ageing native residents, and the different living habits of the new immigrant population. As a result, the substitution of degraded buildings is privately led, and it hardly ever comes to fruition. This unplanned form of reconstruction does not solve any of the underlying land division issues identified as one of the original problems in the borough. Consequently, rehabilitation continues to be irregular, disorganised, congested, lacking in concerns over the sunshine and natural light, with poor optimisation of land and low quality in architectonic and landscape terms.

(c) Local government regulations have legal vacuums that include contradictions regarding habitation norms and practices that appear separate for Spaniards and the immigrant populations. This situation, which in principle favours immigrants, ends up creating a scenario where legal immigrants take advantage of their status to extort illegal residents abusively. In any case, it requires a full review of the current regulations.

Designing the City

The analysis described above contains all the determining factors for project designs and propositions. A group of designs focused on inclusive housing with the objective of finding suitable typologies for all contemporary habitation styles were produced. Given the little architectonic value of the area the preferred option in some instances was to redefine the urban layout with an all-encompassing series of 'surgical operations'. New blocks were built to substitute existing ones which increased construction capability and improved architectonic and urban quality in the areas of intervention (Fig. 10).

Other proposals respected the idiosyncrasy of the borough by preserving layouts and remaining contextually aware of the pre-existing city, although these also suggested improving the city's functional structure and urban image by undertaking small-scale interventions of minimal impact. They achieved this by substituting buildings or large sections of blocks though they never altered them. Consequently construction capability increased and the area was also equipped with flexible housing typologies.

The trigger for another interesting project (Fig. 11) was the variable outline of the streets and their buildings, which range from one to six stories high. In this case, the urban outline was filled with new construction to attain the maximum possible permitted height. In the lower part of the streets, existing buildings were preserved,

Fig. 10 Requalification of the blocks (author: Samayda 2012)

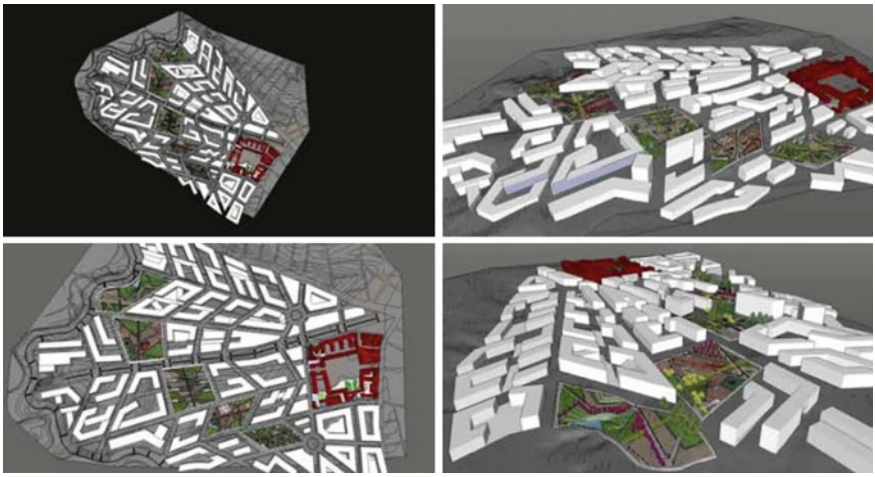

Fig. 11 Landscaping qualification: spreading greenery throughout the existing built environment (author: Zamudio 2012)

and empty or inner spaces were utilised to build new bearing structures and access ways to higher constructions.

The urban landscape quality and the deficiency of green spaces and natural light spots created a set of projects that opted to spread greenery throughout the existing built environment producing a porous urban fabric. Some projects chose to open up squares by demolishing a few of the existing blocks, while others suggested touching-up the free zones inside street blocks by generating a green network set against the road network. In some instances, greenery was also employed on roofs creating a new vegetation filled upper level in the city. It was designed to be able to accommodate community gardens, recreation areas, and reduce the heat island effect.

One of the most interesting designs for urban space improvement was the design of a pair of two-way bridge-streets that crossed over the whole borough and allowed the citizens a fluid connection from one end to the other without having to amble through steep slopes. These bridge-streets were conceived as landscaped zones that also presented the option of building upon the upper part of certain stretches thus increasing buildable space (Fig. 12).

Completing the kaleidoscope of proposals were suggestions for environmental improvements in infrastructures and services. All of them tried to maximise social, anthropological, and ecological benefits (Fig. 13).

Recycling Industrial Areas as a Strategy for a City in Crisis: the Case of Alcalá de Henares:

Alcalá de Henares is a suburban city located 25 km away from the capital of Madrid. It is used as a dorm city, and it is also one of the capital's industrial zones. The city's privileged geographic, climatic richness and wealth in natural resources

Fig. 12 The concept of bridge-streets (author: Fernández 2012)

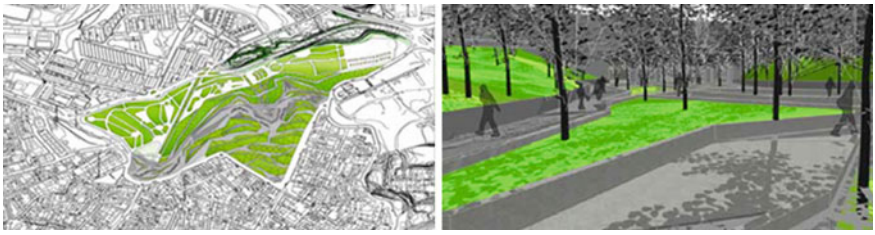

Fig. 13 Environmental improvements: a big green network (author: Cocarico 2012)

have made it a settlement area of choice from prehistoric times. It was the city of Complutum in the Roman era and experienced a period of greatness during the Renaissance. Today the city is a central industrial zone even if a subsidiary of the capital. Historically Alcalá increased its value as a strategic location thanks to the ancient Roman road that crossed the Iberian Peninsula diagonally from north to south.

Currently, Alcalá de Henares maintains a similarly privileged status within the Spanish transport system, located exactly where roads and railways link

Madrid-Zaragoza-Barcelona on their way to France. This suburban area is situated in one of the most industrially developed areas in the country, so much so we could even consider calling it the "dry port" of the capital. Therefore, Alcalá cannot be understood as wholly independent but rather as a part of a highly powerful economic and urban industrial conglomerate.

The incessant relocation of industries that begun a few decades ago has resulted in the loss of its once lively production, and the city has suffered radical change. To make matters worse, the current global crisis has forced the closure of many businesses and slowed down new investment. As a result, we find previously active industrial grounds located right in the heart of the city that is now out of use. Due to this recent industrial lack of productivity, Alcalá has been forced to redefine itself and its future development, and it has taken full advantage of this niche of opportunity. It has recovered its impressive historical legacy thanks to the city being declared a Human Heritage site. It has also restored the historic University of Alcalá to its former glory in the Golden Age thus reactivating a significant part of the economy that comes with it.

It is in the midst of this "Urban Renovation" from industrial to the post-industrial city and the opportunities it brings with it that we propose to carry out our work. The design studio's chosen area for intervention was the large linear fringe that borders the historic old quarter and railway tracks. During the 1960s, this area was still on the periphery, and it was not unreasonable to have it chosen as the preferred location for industry far from the old quarter and close to the train station. The enormous expansion Alcalá city enjoyed thanks to its buoyant economic period resulted in the area being engulfed into the central part of the city and it is here in this long ago industrial linear fringe, now a merely unstructured urban void with residual connotations despite its strategic and privileged location, where we base our proposal for urban recycling. This area is configured as an industrial framework isolated from the city by railway tracks and newly developed residential areas. All of it is a mixture of the historical, the new and the productive.

Recycling the Industrial Areas

At this point, we should add that current trends in future planning for industrial grounds in metropolitan areas far exceed real needs considering present and short-term expectations. Specifically, in the area of Greater Madrid, we are addressing plans in place for new industrial grounds that if followed would not be fully occupied in the next 80 years at the rhythm of today's industry.

Following our specific teaching guidelines, students are encouraged to make decisions for project proposals based on conclusions arrived at during the process of analysis. Students are not asked only to find a solution to a particular problem; rather they are requested to do both: first, identify a problem, and second provide a solution. We implement a different teaching model by making the choice of project

part of the project itself. As a result, projects are approached in a myriad of ways covering an interesting range of proposals that we will discuss here.

A railway track that scars the city acting as an urban barrier triggered the choice of working in the rail zone. The following issues were identified: a lack of communication between the two urbanised sides of the railway; urban voids spread throughout; the degradation of colliding industrial grounds; impoverished urban landscape; acoustic contamination suffered by nearby households; and a low quality of architecture.

This diagnosis gave way to projects focused on the urban structure with a tendency towards improving environmental and architectural quality. In one example urban voids were used to create an integrating park. The leftover soil from construction works was used to form upward batters that formed an acoustic barrier to protect closely households from excessive noise and also improved urban landscape (Figs. 14 and 15).

Interest in improving urban and interurban mobility gave rise to significantly inventive and environmentally sensitive projects. One of the many projects that stand out in this regard was developed taking into account the dorm City character attributed to Alcalá on Madrid. The objective was to promote the use of trains as one of the better urban alternatives for environmentally friendly and sustainable travel. To achieve this, work was carried out not in the physical urban space but in the design of commuting train carriages. These were adapted to enable passengers to work while travelling which allowed them to start their working day as soon as they stepped inside the train. Travellers would clock in at work from the train using the readily available Internet connection saving them an average of one to two hours a day of the total working hours.

Following this line of thought, another project made use of some old discarded silos found close by the station and adapted them to become a giant transport interchange network for babies and children of school age. Before taking the train, parents could leave their child or children there where they would be later taken to their respective nurseries and schools using an exclusive public transport system designed solely for this purpose.

Another interesting project involved in urban mobility produced a design linking all urban green spaces and created a large green network inside the city that incorporated a comprehensive bicycle lane system. This idea was the result of a variety of studies made around citizens' habits in their choice of transport (Fig. 16).

Fig. 14 Integrating park on the urban voids and noise reduction project. Author: Rodriguez (2012)

Fig. 15 Plan for the improving of environmental and architecture quality along the railway track. Author: Rodriguez (2012)

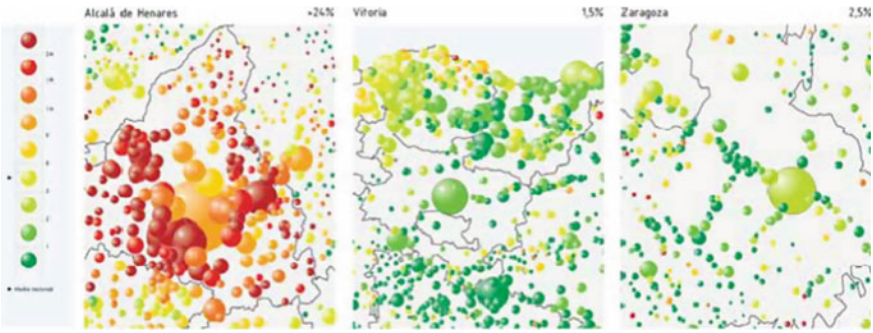

Fig. 16 Mobility and commuting analysis of three Spanish cities: Alcala de Henares, Vitoria y Zaragoza (*source Digital Atlas of Urban Area, Ministerio de Fomento* 2012)

As an inherent feature of dorm cities, it was confirmed that the average private car usage was higher than in other Spanish towns.

So the objective was to build a fully comprehensive bicycle lane scheme widely accessible to all with the aim to promote a healthier and more sustainable transport system. A ground-breaking aspect of this design was the manner in which it took every opportunity the city had to offer to create the structure with minimum intervention or expenditure. It laid out new paths by using old passageways and parking plots, and introduced improved pavements along the way. What was achieved with this form of low budget intervention was truly staggering: a noticeable increment in nature abundance inside the city and a sustainable bicycle transport system (Fig. 17).

There were also several interventions that studied turning former industrial estates into housing grounds. Included here is a particularly fruitful one in regards to the way it regained control of previously industrial grounds and converted them

Fig. 17 Bicycle lane transport system project (author: Merinero 2012)

into residential areas complete with urban vegetable gardens. The soil of empty spaces left over after deep foundation works was used to generate vegetable garden plots that served as a striking green cover that can partially span the entire site. Again introducing nature into the city proved to be compatible with the efficient use of the highly valued land space located in the middle of the city (Fig. 18).

Fig. 18 Reuse of industrial ground for housing and urban vegetable gardens (author: Siena 2012)

Fig. 19 Overlapping of layers: existing industry coexists with housing and green areas (author: Arteta 2012)

The old industrial plants inside zones that had been engulfed into the urban area as the city outgrew its former boundaries also presented a new dilemma. If left untouched they would remain an area of the city that would be active only for a few hours a day. They would hold little urban appeal and offer a negative image of the city and if they were completely dismantled their productive capacity and economic gains would be lost.

Still, this scenario gave birth to several good alternative projects. One of them chose to maintain existing facilities, introducing housing and tertiary use areas. This plan combined the new with existing infrastructure of plants and hangars. The city appeared as a layer above already functioning industry without hindering its activity or productivity. The result was an incremental social and economic density and larger urban capacity (Fig. 19).

Another particularly intelligent solution suggested the action should be focusing on building "streets" inside industrial estates. These streets were conceived to act as curtains behind which the general industry remained untouched.

Conclusion

The objective of the design exercise was primary to recover the citizen's interest in the streets. The situation called for a meticulous analysis of various urban contexts and their specific needs, and after it was conducted, some constructions were designed to be built along the industrial fringe as a result. The design created a new and lively scenario bursting with activity with a widely diverse landscape that would enhance the quality of the city (Figs. 20 and 21).

Fig. 20 Building "curtain streets" like new facades of industrial estates (author: Alhambra 2012)

Fig. 21 A new and lively scenario are enhancing the quality of the city (author: Alhambra 2012)

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Part III
Philosophy and Built Environment

Cloud10: Inflated Ideas

Lisa Cumming

Abstract The lethargic nature of massive permanent architecture, resulting from the manner and material in which we build, creates the opportunity for built form to be flexible and adaptive to our contemporary practices and programmatic undertakings. While mass and matter have dominated building practice and performance, there is the potential for greater flexibility within built structures. Such flexibility would better enable fluctuating social structures and evolve how built form might facilitate more fluid and dynamic programme. Category5, a team of postgraduate students set within the Architectural Association's Design Research Lab (AADRL), seek to provide a new means of light and adaptive architecture. A series of patterned inflatable foil structures become the premise for adopting air as mass and structure, to enable a lightweight architecture of flight. Through the means of design experimentation, digital simulation and physical prototyping, a method of design is developed to pursue the nature of interactivity and immediate response that is so prevalent in our everyday digital technology but lacking in our built environment. The design brief, in particular, is to provide a research centre in the Antarctic for meteorologists who are currently burdened by both the unforgiving context of the frozen continent and the inertia of current research centres on site. The resulting project, Cloud10 evolved via the imperative search for real-time adaptation to the unpredictable nature of environmental conditions and the provision of a flexible structure that responds to the changing needs and programmatic schedules of the researchers. Cloud10 is a prototypical endeavour that adopts lightness as a construct, not simply a concept, providing stability via mobility and flexibility via contextual adaptation.

Keywords Inflatables · Airborne architecture · Prototypical · Migrating urbanism · Self-organisation

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Introduction

The Weight of the Matter

> […] I am not optimistic or pessimistic. I feel that optimism and pessimism are very unbalanced. I am a very hard engineer. I am a mechanic. I am a sailor. I am an air pilot. I don't tell people I can get you across the ocean with my ship unless I know what I'm talking about.
>
> (Fuller 1983: http://www.bfi.org/about-fuller/resources/articles-transcripts/only-integrity-going-count)

Architecture is heavy. Constituted by mass and matter, it is as weighty in physicality as it is in the procedure, with few operational exemplars of flexibility and adaptation. With a certain inherited sense of latency, architecture has acquired methodologies and procedures that propose it as a predictable, linear and process-based means of providing spatial solutions for the daily and not so daily programmatic operations we undergo. Such procedural standardisations and stabilised outcomes have resulted in predictability where we instead have the opportunity for novelty above procedure and adaptability above permanence. We have an architecture of mass.

Mass has always dominated the building industry. While mass supports stability in both a structural and theoretical sense, it imposes a slowness, a lethargy upon architecture, limiting, what Category5 proposes is required programmatic adaptability and physical responsiveness to site-specific conditions. As we make demands for contemporary technology to respond intellectually and instantaneously to our requisitions, we could (and should) demand more from our architecture; an architecture that is not predetermined in composition or organisation but rapidly responds to a number of conditions, operating within a system of parameters that employs efficiency in materiality, modeled off nature itself. What we demand is an architecture of lightness: where mass is air.

To test lightness as a construct rather than a concept, Category5 proposes an airborne architecture that challenges the ground plane beyond a traditional sense of static omnipresence. Instead, the ground plane would exist temporarily as a means of launching the architectural system, consequently becoming self-referential. In removing the ground plane, the architecture is freed from a fixed state of stability. Instead, seeking dynamic stability via movement enables immediately an adaptive system that aims to calibrate and communicate with itself and its environment. The architecture becomes its ground plane eliciting stability as self-referential and adaptability as site-referential. In arguing for a mass-less architecture, Category5 argue for the notion of a synchronised and systematic collective, constituted by a network of task specific units as embodied by natural phenomena such as the siphonophore (class of marine animal) and slime mould.

Specifically, Category5 propose an airborne architecture, situated in the airspace of Antarctica, to facilitate research expeditions within the fields of meteorology and climatology. Such a brief demands the architecture be light and adaptive to extreme and fluctuating conditions and evolving research expeditions. An operational

network comprised of static research hubs has existed on Antarctica since the 1950s. Cloud10 is an airborne system that acts to compliment, rather than replace, the existing architectural infrastructure. This system means that the existing infrastructure does not become redundant but relieves the Cloud10 system of particular service and storage burdens that would otherwise compromise or limit the proposed operation's pragmatic abilities and potential.

Context: Site

> Coldest, windiest, driest place on earth/holds 70% of world's freshwater/doubles in size in winter/up to 250 km/h winds and −70 °C/owned by no state but claimed by many/desolate in winter/inhabited by thousands in summer (Garcia 2009).

The site plays a fundamental role in Cloud10's deployment. It is the basis for programmatic, material and organisational decisions. In choosing an extreme climatic location, the limits of material and organisational performance can be vigorously and adventurously tested. Paramount to Antarctica's operation is that it is neither politically owned nor governed by a single body. This ambiguity in ownership emphasises a collective gathering and sharing of information, an underlying agenda of the Antarctic Treaty that will be reflected in the architectural organisation of the inflatable components that constitute Cloud10. A rich data mine for the fields of meteorology and climatology, the location, hosts an infrastructure that enables the generation of large, internationally sourced datasets that have been made universally accessible for decades, though limited in their distribution. Such demand for rapid data production asks for an intervention that is quickly deployable. This is unlike the slow and grounded existing research facilities. This intervention is set literally within the research sample, the atmosphere.

Antarctica saw its first permanent base set up by the American Navy in 1956 and the Antarctic Treaty, an international agreement, was effective as of 23 June 1961. The Treaty limits military activity and supports the role of research on the continent. However, this research has been limited predominantly to the outskirts of the continent due to the difficult central terrain, where only short-term expeditions take place via the implementation of smaller, slower land vehicles. Also, restrictive to such expeditions are the aggressive wind conditions averaging at 130 km/h that can be both sudden in their onset and unpredictable in their pattern, depending on season and location.

The generated data collected from the ground, core and air samples are intended to be shared amongst all facilities and nationalities according to guidelines set out by the Antarctic Treaty. However, this rarely happens in the ways intended due to the physical distances between stations and inability to digitally distribute this data

in a prompt and comprehensible manner. The data is fundamental to the projection of atmospheric phenomena on a global scale. Since Antarctica is an environment with extreme seasonal changes, it requires an architecture that can seamlessly monitor and adapt to these conditions. To overcome inherent issues with the architectural situation in Antarctica, Category5 propose Cloud10, a facility comprised of programmatically inherent singular units (zooids) that are predominantly airborne, hovering at around 500 m above the sea.

British Antarctic Survey (BAS) & Halley

Suspending Cloud10 at 500 m allows it to overcome the difficult terrain and treacherous wind conditions. This light, partially suspended architecture is in contrast to the anti-model of existing facility typologies, most specifically, the British Antarctic Survey's (BAS) Halley VI. The Halley VI is like all previous iterations of existing deployed facilities, a heavy construct of the major prefabricated pieces. Halley VI is a towable train of pods that are attached to one another in the same manner as any train carriage. This system is so-termed anti-model because although their design intent is communicated as light, supple and easily moveable, Halley VI is, in reality, a large, heavy, and stagnant architecture that drifts by snow as it rests in a stationary position. Other stations—more similar to that of the BAS's Halley VI in that they are completely stationary—are far less convenient and applicable to the type of research that is undertaken on the continent. A vast majority, if not all, of the research that is done, is performed away from the existing stations either by expedition over a longer period, or a short series of smaller excursions in and around the existing bases. Information gathered on these trips is then brought back to the laboratory facilities where they are recorded, studied, processed, and submitted to the knowledge base for atmospheric analysis and projection.

In such remote conditions and extreme terrain, flight presents itself as a unique way of accessing currently inaccessible regions of the continent, overcoming the lethargic, inefficient architectural response and various wind conditions that currently hinder research onsite. In placing the airborne facility within the tropospheric realm of data collection, the deployment of investigation vehicles and analysis is not only much easier but also provides the researchers with a unique face-to-face condition with their research sample. Currently, data is only acquired via long distance instrumentation deployment, gathered from the troposphere and beyond and undertaken without human physical supervision. Data sets are returned by these instruments, making it difficult to analyse anomalies and unexpected results or devise innovative collection methods in response to the newfound information. In situating the research operation semi-permanently and literally within the space of investigation, a closer, more candid point of observation is established.

Meteorology

> The Antarctic ice sheets are a 'climate museum,' providing the world with a legacy in the ice: tiny bubbles of air from past times. (McGonigal 2009: 58)

As earlier noted, the infrastructure for meteorological and climatological research in Antarctica already exists and is addressed by various standardised tasks that can last for some minutes up to several weeks of data collection, using a combination of very straightforward and sophisticated technologies. The architectural proposal is responsible for efficiently facilitating this scope of tasks in a manner that brings scientists closer to their subject matter with a degree of flexibility, not otherwise accommodated for in the contemporary archetypes. An existing information flow of collected data is clearly mapped out by universally established techniques and time intervals, to provide accurate climate and weather forecasting. So as to perform these designated research tasks, the Cloud10 zooids operate within four key physical states: hover, tether, ground and float. The research programme then determines the programmatic breakdown, architectural configuration or organisation, and its reconfigurations over time.

The four physical states are attributes inherent to each zooidal unit of the Cloud10 system. This singular unit is programmatically neutral until deployment when it performs specific tasks or spatial accommodations according to its situation within the greater cloud colony. Fundamental to Cloud10 is the instalment of systematic redundancy to avoid over-efficient autonomy, such as in the pod-like proposals of the 1960s. Instead, degrees of redundancy provide a clear system of adaptation with inbuilt parameters that facilitate levels of adaptability.

Clouds: Organisation

> The role of the architect here, I think, is not so much to design a building or city as to catalyse them; to act that they may evolve (Pask 1995: 7).

Organisational strategies of a two-tiered nature have been developed based upon the structure of siphonophorae. Siphonophorae is marine invertebrates that model inbuilt redundancy as each component (zooid) is task-specific yet incapable of performing its task without the functioning support of the system (siphonophore, or in Cloud10's case, the cloud) as a whole. The zooid is the singular unit that constitutes the collective siphonophore of self-similar (but not replicate) cells so that holistically the system is autonomous. This autonomy rules out redundancy within the combined system and ensures that each unit has a specific task.

Within the flexibly organised Cloud10 system, a zooid can detach from the collective and to slime mould, so as to reattach at any given time according to designated operations.

Collective

The zooid is only considered an independent entity within the early systematic launch stage. The system is otherwise reviewed and operational as a collective, constituted by locally communicating cells that universally adapt to changing programmes and fluctuating environmental conditions. The collective operates as a city in the sky, a cloud exhibiting global patterns of migration and adaptation.

Zooids

At times, the system will require the deployment of smaller aggregates that form aerofoil geometries or singular zooids. The zooids are deployed to perform research expeditions that are then re-accommodated by the colony in their smaller formations.

Geometry

The zooidal unit takes geometric form by way of the hexagon, allowing for optimised compactability while maintaining omnidirectionality. This principle is carried through into the collective realm, where subsets of radial geometries are formed by the zooidal units. These then aggregate to form the spine, plateau and tower elements—each formation serving a unique and integral purpose.

Spine

The spine is the primary element of any cloud colony, creating a clear circulation trajectory off which other subset geometries are formed (Fig. 1). It is what connects all radial formations. It is the only open geometric system which governs the size and directionality of the cloud colony.

Radial

The radial is the secondary subset of geometry. It is a closed geometric system of 5–9 zooids that aggregate to form the greater body of the cloud and thus creates programmatic zones according to its placement within the cloud. For example, radials

Fig. 1 Render of a spine formation, beginnings of a cloud (*source* Cumming et al. 2012)

that enclose research laboratories are located as far from the living quarters as possible and may form towers to reach sample space well above the inhabited air spaces.

Networking

The purpose of forming a collective colony is not merely to generate geometric order but primarily instigate a networked facility that shares resources in a manner that exemplifies a whole being performatively greater than the sum of its parts. As a zooid connects to another via one of the four chambers, each unit's air and helium networks are joined as if to form a universal lung. In doing so, one zooid can sacrificially give its resources to another, benefit the scenario when the occupational densities vary across the cloud.

Bodyplans

As in nature, the aggregated system of the Cloud is formed around some scenario-specific collective formations that allow for degrees of freedom, within a set of programmatically and pragmatically governed parameters. The cloud is predominantly an aggregation of radial formations, allowing for greater connection

of programmatic spaces. It inherits a flexibility to break into smaller arrangements such as aerofoils, helium stacking and space connections.

Singular

The singular derives from a base design that then responds and adapts to localised and specific programmatic requirements or environmental forces operative on the zooid. The primitive hexagonal geometry has dynamic packing properties that are augmented by way of an intelligent, patterned skin that allows for directionality, expansion and rigidity. The four core constituents of the singular unit are the skin, veining, inhabitable chambers and materiality.

Skin

The zooid employs an armour of patterned foil pieces to create a hyper skin that envelopes all other zooidal components, designed to allow for expansion, aerodynamics and dynamic stability (Fig. 2). The geometry is activated by helium inflation but is controlled by the skin and its structural vein patterning. This hybrid of skins and geometries enable properties of locomotion, movement, interlocking and impact absorption.

Fig. 2 Render of zooidal skin section, illustrating various patternings (*source* Cumming et al. 2012)

Veining

Veining occurs across the hyper skin and throughout the internal shafts and chambers, employing a non-linear patterning. Areas of vein densification incur rigidity in the structure whereas the lower resolution of veining allows greater flexibility of the skin. The veins enclose a system of high-speed air propulsion that forms structure, relieving the zooidal design of excess mass.

Inhabitable Chambers

The inhabitable chambers are actuated similarly to the movement and expansion of a lung when breathing; inhaling more air to increase the space as required for inhabitation and redistributing or exhaling the air when not. Reaching maximum expansion value necessitates the use of another zooid's air supply via the network.

Materiality

> In nature, shape is cheaper than material. (Beukers and Van Hinte 2005: 44)

Precision in form and material is what lays the foundation to achieve efficiency, flexibility and scalability of the system. With the need for adaptability comes the need for a responsive, pliable and supple material that can respond to the ever-changing landscape and its thermal conditions. The cyclical environment with its constantly changing weather patterns reinforces the need for a responsive and adaptable material membrane. In this regard, the material system aims to remove mass by employing Mylar foil membranes, articulated by patterning to allow for areas of movement versus areas of rigidity. These Mylar foils are used in high altitude weather balloons and are lighter than neoprene and other rubberised materials used in Antarctic research environments. Foils provide a unique opportunity for patterning via heat sealing methods, promoting control through folding and veining to achieve expansion, rigidity, stiffness and inflation.

The Prototype

> […] the stability of the system is rooted in its dynamics, in its capacity to handle and process movement, change, difference – in a word, information […] (Kwinter 1996: 210).

Upon the establishment of parameters for the collective, singular and material behaviour, the prototypical argument calls for an analogue exploration, or rather an exhibition of behavioural tendencies of the system. The prototype manifests as a series of analogue experiments, complimented or inspired by digital simulation and experimentation of materials, environments and inflation. The prototype argues for the removal of mass, systematic redundancy, self-organisation, dynamic stability and impermanence.

Systematic Redundancy

In using the siphonophore as a premise for systematic redundancy and the notion of complete integration of singular and collective, efficiency and complexity are achieved. Redundancy in the system also withdraws this research from 1960s notions of autonomous pods that achieve a homogeneous, independent collective of pods indifferent to their neighbour's behaviour or condition. The zooids of a siphonophore behave in a manner of fluid connection and disconnection. As a greater volume of zooids is required, they are further produced or reconnected. In another solution, cells can also be shed. However surviving independently, they are unable to function programmatically to their maximum capacity.

Self-organisation

In establishing local communication between zooids, typologies for the organisation can be played out in an environment-intelligent manner, configured according to local conditions and behaviours. In this way, the cloud is not predetermined in either formation or behaviour. Rather it acts in an emergent nature similar to that of flocking birds. In this manner of bottom-up organisation, a clear and straightforward local communication between zooids, both at an autonomous and manned level occurs. Influences such as air pressure, weight distribution and chamber expansion are accounted and compensated for across the entire cloud via localised changes at the zooidal level. In contrast, programmatic redistribution is enforced at a top down human-controlled level by autonomous control systems.

Dynamic Stability

Halley VI gestures toward a notion of mobile stability with its Ski-Doo like legs that annually displace the science complex up to a kilometre a year. However, this completely pragmatic response to the shifting ice shelf and fluctuating ground conditions does not alleviate or innovate any other aspect of the ground operations.

Cloud10 proposes that dynamic stability goes beyond a remedial response and further toward engineered innovation that takes full advantage of airborne mobility; toward adaptability that implores stability using aircraft theory of self-stabilisation as both the environment and the architectural constitution changes. The structural stability of Cloud10 is monitored at a collective level and altered at a local level. Stability is controlled by two design aspects: air veins and helium veins. Air veins continuously recycle pressurised air through the cloud, acting as air beams for the zooids to maintain their form. Helium is distributed across the network in such a manner that achieves neutral buoyancy in both the colony and each zooid, according to size, location and necessity.

Impermanence

The case for impermanence is not linked to the argument for environmental sustainability in the manner of an eco-fad. Rather, the belief is that to overcome the Antarctic environment that exists in continual flux, a pliable system that has a realistic design life and holds a light footprint on the continent, by the Treaty, should be implemented.

Prototypical Experiments

It is quite simply not sufficient to cogitate such terms of adaptive inflatables solely at the level of digital simulation, as the results could speculatively be reduced to notions of engineered behaviours and elaborate animations. While that is categorically not the case for Cloud10's simulations, what is significant in the Category5 research process is the feedback loop setup between analogue and digital exploration, both of which inform, inspire and correct one other. Specifically, the ability to gain control of flight and inflation proves an intricate and integral process that is modelled most exemplarily in the largest of our prototypes, measuring 4.5 $\times$ 2 m and filled with helium enough to lift 30 kg. This prototype was built at the Architectural Association's Hooke Park Workshop, Dorset, and consisted of three main inflatable volumes, four iPhone controlled propeller shafts and primitive structuring air beams (Figs. 3 and 4). The prototype served as a means to test control methods and the performative behaviour of such large volumes of helium. The prototype also informs all digital work that responds to inflation, locomotion and the behaviour of helium. This prototype additionally develops some integral foil patterning and fabrication techniques and the nature of gaining neutral buoyancy over large-scale volumes via four key avenues: control, geometry, inflation and actuation.

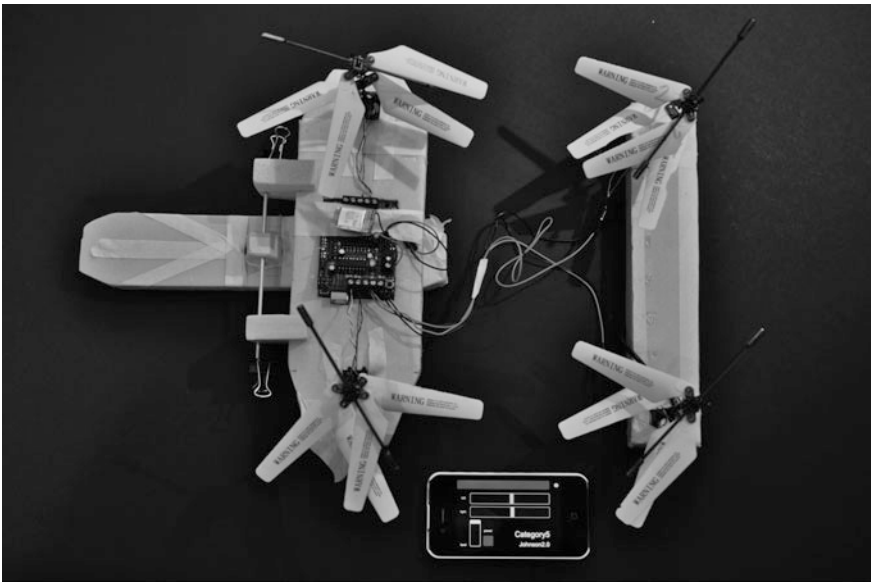

Fig. 3 Early mechanical set up for iPhone/Arduino Motor communication (*source* Cumming et al. 2012)

Fig. 4 Large prototypical model developed to simulate simple zooidal inflation and behaviour (*source* Cumming et al. 2012)

Control and Migration

It is critical that a system that demonstrates clear, perceptive control be developed. This suggests devising methods of propulsion that are employed to complement the passive lifting abilities of helium. An iPhone interface controls this propulsion, tapping into the intuitive nature of the iPhone via hacked DJ'ing software, managing the zooid's directionality, speed, lift and descent. This arrangement allows our system to be managed wirelessly, employing the very adaptability and rapid response that Cloud10 demands from all other operational and behavioural aspects.

Patterning and Geometry

Patterning and geometry of the zooid are what manages the singular unit's rigidity and flexibility and thus, the cloud's adaptability. Various patterning techniques, employed predominantly by the zooidal skin, include pocketing for expansion, diagrid air veins for rigidity and sharkskin surface folds for friction and hold between zooids.

Inflation and Propulsion

Integral to inflation and propulsion abilities is the ratio of air to helium; weight to weightlessness. These ratios, tested out, against various volumetric geometries, give clear direction toward refining the volumes of the singular and allowing for gas distribution and calibration within the system. Various propulsion setups were tested on some blimp-like geometries with increasing degrees of formal complexity until manners of neutral buoyancy were refined.

Communication and Actuation

Finally, the model requires actuation through digital interfacing that simulates a full-scale Cloud10 operation. The developed iPhone interface negotiates this as a feedback loop, established between the zooid's motor system operated by Arduino, the phone's control panel App and a laptop that overseas and documents all communication. It is at this level that local communication and negotiation between neighbouring zooids would actuate global activity, instigating the very bottom up behaviour that Cloud10 advocates.

Conclusion

In response to the current architectural condition preoccupied with the heavy and static notion of providing occupiable space, that Category5 coins as the 'anti-model', a light and adaptive 'anti-model', with inherent reorganising capabilities to better respond to extreme environmental and programmatic conditions is proposed. Presenting a prototypical model that echoes the organisational behaviour of the siphonophore, coupled with investigations into the mechanics and control of flight, Cloud10 outlines the fundamental role that lightness can have in overcoming the latency and lethargy associated with architectural mass. In providing a platform for a self-organising system that defies the traditional notions of a ground plane, the architectural and urban system becomes site-referential for organisational positioning and dynamic stability. Performance is enhanced by employing light and efficient materials by nature's philosophy of optimal shape. These foils are patterned in a manner that affords the zooid's architecture a manner of controlled flexibility and adaptability.

Responding to both environmental and programmatic demands, the zooid and its cloud system employ degrees of redundancy, for the clouds to perform greater than the sum of its individual parts. In doing so, the proposed inflatable environment can respond with as much potential and urgency as the contemporary digital world currently does. In creating an integrated network of zooids that aggregate according to the active scenario via intelligent subsets of geometries, the architecture operates across four core modes of ground, hover, float and tether. Continually adapting to the ever-fluctuating Antarctic environment, Cloud10 becomes the deployable research network that is currently lacking on the continent. It provides the physical flexibility needed to respond critically to the research sharing culture set out by the Antarctic Treaty and endures on the frozen continent using original methods of design practice for architectural and urban research.

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Live Montage in Mediated Urban-Experience: Between Media and Architecture

Maryam Fazel

Abstract The purpose of this chapter is to reconstruct the idea of montage from the context of cinema studies and apply it to architecture, so as to reframe it as a live montage. Live montage is understood here as the new interconnection of spatial concepts such as everyday experience, the practice of the Urban Flanerie, and the semantic or mental juxtaposition of images (time montage) within the body's medium. The nature of montage will be redefined through finding relations in neighbouring concepts, in particular, Heidegger's idea of neighbourliness and neighbourhood to re-evaluate the nature of things concerning other concepts (Walley in *The material of film and the idea of cinema: Contrasting practices in sixties and seventies avant-garde film*. The M.I.T Press, Cambridge, pp. 15–31, 2003). Moreover, the chapter will delineate the boundaries and borders of montage as a concept that redefines itself through its relation to other concepts particularly through its reflections in the interface in everyday life between media and architecture.

Keywords Live montage · Urban Flanerie · Place/time montage · Image recollection · Medium

Introduction

Montage is a process in which fluidity happens after semiotic fragmentation. It is a process in which the real and imaginary are pursuing one another, as if each was being reflected in the other, around the point of indiscernibility (Deleuze 2005). Here the aim is to focus on fluidity as a quality of montage. Fluidity in montage occurs not through juxtapositions of images or events but rather through a process that encompasses gaps and intervals (voids) between images of events to achieve temporal fluidity. Here the reference is being made to the fluidity of time in 'time images' or fluidity in understanding spaces in place montage. Through the idea of

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montage, it is proposed that we can approach virtual/real circular continuity and reflection of one in the other through the path that starts from fragmentation towards becoming (fluidity). This starts from the abstraction of time or space towards fluidity and continuity. In this chapter through moving between the borders of montage as understood in cinema and architectural discourse 'live montage' will be proposed as a result of overlapping ideas of montage in both disciplines. Redefining montage in the new context of our everyday life in which access to pervasive media technologies suggests live montage as a concept through which we can understand the situation and relations of body, place, time and image. The idea of 'live montage' focuses on the process of combined real and virtual recollections of fragmented images and its relations (smells, feelings, sounds, and so forth) that occur through the daily experience of places, by adding the pervasive media layer to our everyday life. In the new context of architecture, not cinema, spectators are active and sometimes mobile. Screens could also be mobile so that the perception of time and space becomes more fragmented and temporal. This chapter seeks to reveal the essence of montage in our everyday life explorations 'in between things' to challenge the conventional idea that montage is a technical apparatus embedded in the medium of cinema. Montage in cinema is a mechanical technique for perceiving coherency. It is more like a black box that spectators observe through, outside the black box. Here montage places the observer as mobile spectators inside the black box of 'live montage' and the coherency of time and place happens in a more complex way as it passes through the medium of the observer/participant's body.

Deleuze's Time Montage: Freed from the Movement Image

French philosopher, Gilles Deleuze points out the potential of the screen to operate like a brain and how cinema operates based not solely on the linkage of rational cuts but rather by the re-linkage of irrational cuts. He sees the role of montage in cinema to represent the time liberated from movement through piecing irrational cuts together. Russian filmmaker, Sergei Eisenstein is one of the pioneers that detached the time being subordinated to movement using techniques of slowing down and reversing sequences, the non-distancing of the moving body, the false continuities of movement, the constant change in scale and proportion, the false continuity of images, the disproportion of scale, the dissipation of centres, etc. Both Deleuze and Eisenstein draw attention to the consequence of the abbreviation of movement specific to a cinematographic image that sets time free from real time. Montage in cinematographic image carries out a direct representation of time (regarding liberation from movement) by reversing the relationship of subordination that time maintains with normal movement.

Thus, time is co-opted not through the flow of movement but rather through times signs or what Eisenstein refers to as 'signaletic material'. The only medium for perceiving time without movement and duration has been a cinematic montage.

Cinema makes visible the relationships of temporal time that can only appear in the creation of images. Montage is an art of the creation of time through chronosigns (Deleuze 2005: 52). Deleuze's ideas of time montage helped to construct the process of understanding time (as coherent change) in cinema through adopting concepts of chronosign, opsign, and so forth. In explanation of montage as a medium that liberates time from the movement, he describes the processes in which we understand the sense of passing time and change via signs that images carry. Similarly, what we experience in our everyday life, especially in the day-to-day exposure to ubiquitous media, is the sense of the passage of time through the signs embedded in that media, even though its time duration is different from clock hours. The same experience of time happens when we follow putting comments on each other's Weblogs such as Facebook or other types of social networking media. The time that we experience is fluid and continually different from the sense of duration that we experience in reality. We feel that the event is still going on, and the conversation is alive although the second person might not be responding at that time.

In cinema, during film projection our sensory motor cannot deal with outside stimuli. We are in a position of standstill, and our experience of the world is through the opsigns and sosigns that media carries. The idea, which Deleuze mentions, is that whenever our body's ability does not respond to the stimuli of the external world, the link between the virtual world and reality commences. In other words, when we cannot explore and collect information from the environment through movement, when our sensory motors, which respond through movement, stop responding we become detached from reality immersed in virtual. It is this time of ambiguity of the sensory motor that perceiving the chronosigns of montage becomes possible through opsigns and sosigns of the cinema apparatus. This connection of reality with the virtual and perceiving the passage of time in a different way is now departing from cinema and enters in our daily life experiences. Whenever we are in a position that we are informed through opsign and sosigns of cinematic apparatus (for example when we are exposed to pervasive media, mobile devices screens, and so forth) the cyclical process from reality to virtual occurs. This type of circulation detaches us from reality. What we perceive in our life is a temporal structure of time that clearly goes beyond the conventional perception of time known as the past, present and future. It is, for example, a co-existence of distinct durations, or of levels of duration. A single event can belong to several levels: the sheets of past coexist in non-chronological order (Deleuze 2005). Coexistence of many different times, such as social times and media times, gives us a circular, repetitive temporal sense of time.

Place/Time Montage: Traversing Fragmented Places

The idea of 'live montage' allows for the pursuit of the theorisation of montage as a form of continuity and fluidity of "place fragmentation" in motion. Place montage is a mental installation that transforms fragments of places explored through walking

into one unity. Mental Installation is a memory based recollection of images of reality and virtual reality in a form of virtual installation that is formed mainly based on the relations of fragments and is a result of a recollection event process. Place montage is done by monitoring spectators (Flanerie) in motion, studying street-walking as an installation that merges fragments of perception of places or events, and reinventing and transforming spaces that we experience based on connecting the points of place and time through a walking process by our vision apparatus. Place montage mainly focuses on walking freely while capturing the sense of place in just short fragments and through the path between the first place towards the following event finding a mental coherency.

We capture fragments of places, fragmented recollection of images accompanied or attached by smells, feelings, sounds of the places or events as a form of memory which Deleuze mentions as the virtual version of any real event (ibid). The process of meaningful coherency of these fragmentary perceived images of places happens through moving from one place to the other and through intervals of mental coherency. After adding the layer of media to our life, we recollect images that are not directly found in the places that we experience. We are exposed to images and narratives that might not be attached directly to daily places, and they are captured and recollected with pictures of our everyday life. They are processed as part of our quotidian events while they have a different quality of being immaterial and inside a second medium. Previous to new media and smartphones we captured images of events and places (with attached relations of sounds, smells, feelings, and so forth) and through the process of mental installation or mental montage we made coherency of the recollected events (Pallasmaa in Treib 2009). Nowadays the condition is that we are exposed to media, or fragments of it, based on where we go and what kind of activity we do on daily basis. The concern is that we are more and more exposed to media images and its temporal time, and as a result, the circulation to the virtual/unreal world happens more often. Moreover, our awareness of places that we experience is combined with information that we receive from the media like unfolded layers of screens projected on city facades. This leads to questions of the how the mind receives, recollects virtual images and how it distinguishes the images captured from reality from the images captured from a virtual medium of the same place.? Does recollection of reality exist in the same layer as a recollection of virtual images? Does an intermediary chain link images of reality with images of virtual? If so what chain is it?

Inside the medium of ‘live montage’ exists a combination of images of reality and virtual images which we recollect at once as a type of an event-based process of experiencing a link from point A to point B. If we imagine memory is a box of recollected images of reality or, in other words, recollected images of the events that we experience, we collect images of pervasive media at the same time while they are not raised from the context of physical places or at least are images inside another medium and do not directly respond to our sensory motor exploration. When we recall the images of a memory whether it is a recall of a place or an event, images of virtual (images inside a medium) relate to images of reality (images of places) through intermediary chains.

Deleuze explains that virtual images are images that we perceive not through our physical movement and exploration but rather through the situation of standing still. When we stand still, the optical situation and the aural quality that Deleuze categorises them within i.e. chronosign, opsign, sosign) replace the sensory motors that help us to obtain information through body movement. When the body loses its ability to explore through physical movement (for example exploring the screen just through opsign and sosign), the virtual realm starts emerging in response to the lack of information or exploration possibilities of moving within the space. It is through this quality of moving images, especially montage, which the repetitive switch between realities and virtual happens (Deleuze 2005).

The idea of 'live montage' as a black box in which the processing of recollected images of reality plus virtual images of our modern technological life is happening in the context of daily places and not in cinema, means that the spectator (observer) is inside the system of montage (inside the Black Box). The mental process of this type of montage is mainly process-based montage of places or events that occur in the medium of the body. Both time-image montage and place time-montage rely on the medium of the body to find coherency and continuity. Without passing through this medium and taking advantage of the intervals in moving between places as points of transition no mental montage would be possible. As Eisenstein (1969) has mentioned semantic montage happens in the gaps between images when they melt into one another.

Travelling through and along sites with vision or a perceptual machine allows the construction and reconstruction of new geographies of places based on images captured and recollected within the medium of observer's body as the final medium. Consuming space and time, reinventing places and transiting from one place time to another all happens under the idea of 'live montage'. Architecture and media studies theorist, Bruno (1993) reflects on the Surrealists who loved going to the arcades and movie theatres. They established an activity of film reception based on urban transitory pleasure. Constantly wandering from theatre to theatre, continually entering and existing in the film medium itself, they constructed a place montage of filmic experiences. Explaining the idea of trans-subjectivity and the consistent shift from subject to object and moving in-between things and spaces, Canadian social theorist and philosopher, Brian Massumi explains that the concept of quasi-corporeality is an abstract map of transformation between body, its image and object of experience. "The quasi-corporeality can be thought as the superposition of the total of the relative perspectives in which the body has been implicated, as object or subject plus the passage between them" (Massumi 2002: 47–53). Here the body expands through fragments of experiences and exposures to virtual media—similar to the practice that Surrealists were establishing as a mental installation of image/place montage. Within this type of mental installation images captured from new media play a major role in the place/image montage of activities.

Experiencing through the eyes of a mobile female spectator-voyageur, not through the male gaze, a move from gaze to Flanerie also called the "modern gaze", is happening in both architecture and filmmaking (Bruno 1993). Like a voyageur, in this form of perception of the space, urban geographies are perceived as temporal

unintentional passages that 'expand with close up and extended through slow motion' (Vidler 2002: 114). Spectators reinvent their relations to the film or the site through various trajectories and follow the narrative of architecture or filmic frames. They also transform the narrative through their movement and engagement visually and tactilely with the site. Inhabited sites are temporally narrativised by motion (Bruno 1993). A narrativised space, which is intersubjective, is a complex of socio-sexual motilities. Travelling physically in the space followed by the travels of the mind brings alive the idea of montage as a juxtaposition of fragments of spatial representation. This emerges as a dislocated mixed reality with virtual points of time/event that has passed through the subjective medium.

Vidler's (2002) social, architectural exploration of our every day is more similar to associated fragments of places whereas Bruno's Flanerie is more like a reinvention of reality through the exploration of physical spaces. It is an apparatus, a mechanism of production and reproduction of narratives and space (Bruno 1993) that happens through our everyday life exploration of urban spaces. We capture images, fragments and frames while we move in architectural spaces. The spectator moves between a series of carefully disposed of phenomena that s/he observes sequentially with their visual sense. Alternatively, s/he mentally moves through a path designed for the mind of an immobile spectator in cinema theatres through the art of montage. The path could also be a two-folded idea that the mobile spectator participates in a process of 'live montage' with the help of technology and ubiquity of screens in our daily life, accompanied by the human camera apparatus.

Montage as a Process of Becoming that Happens in Voids/Intervals/Transitions

Montage is not only an assemblage of space-time or image collections. It is a process of becoming that happens through the gaps in between its fragmented elements. Through these gaps or intervals that connect point A to point B, our imagination has space to manoeuvre, so as to fill the spaces in-between and inject semantic coherency for reconfiguration. It is in the space between subjective spectator and space-time fragmentation that a new type of reality emerges, for this reconstructed, dislocated time place reality. It is a dynamic, holistic system that encompasses all mediums—cinema, architecture and the body.

American philosopher and psychologist James (1907) argue that experiencing the world does happen based on a process, and the transition from one architectural experience to the other is continuous in a sort of conjunctive relation. Similar to the idea of fluidity and continuity in place Montage, James (1907: 36) argues for "Unity by continuity; experience in whole is a process in time; knowledge of sensible realities thus comes to life inside the tissue of experience. It is made and created by relations that unroll themselves in time".

From known point A to known point B, our experience of knowing is in transit and before getting to point B, we are already a virtual expert of point B (James 1907: 23–31) even though we have not reached it. Likewise through deconstructing our everyday events and based on the idea of 'live montage', experiencing the world does happen due to a process of transition from one point of the event to the other no matter even if it is partly virtual (i.e. a media event point). Through this transition of points of events, we know the departure before our arrival at that point. The process of 'live montage' covers the virtual and real, material and immaterial quality, leaving gaps for imagination in-between points of events to obtain coherency. Live montage is no longer concerned with cinema. It is expanded and exists out of the context that it was born from. It still carries the concepts of intervals and the role of intervals in the process of coherency. However, the relations of continued transitions through intervals are what make our experiences cognitive. Knowledge consists in intermediate experience (possible if not actual) of a continuously developing process (James 1907: 29). In cinema, Eisenstein mentions the role of intervals, which James calls transitions, as a component of the kinetic production of illusion. They increase the intensity of meaning through applying meaningful rhythm. Through walking, each event has a location so the space-time between events is considered as intervals that result in meaningful coherency.

For Eisenstein (1969) architecture could embody the principles of montage. In his observation using the architectural historian, Auguste Choisy's "picturesque" view of the Acropolis, Eisenstein compares architectural composition with cinematic montage believing that architecture unfolds its layers of composition through the journey that a spectator takes. Being aware of the pace of spectator's movement and measuring the distance between spectator and building as well as keeping the rhythm of space allows architects to produce architecture as 'live montage' (Vidler 2002). Exploration of new urban context is not entirely subjective and is based on being exposed to different narratives. Screen projection on façades of building unfolds a new story of the envelope of that building. It alters the perceptual condition of the site, at least temporarily. It crystallises a vague sense of unaccustomed possibilities putting on standby the general function of the building. The façade that we pass by every day is temporarily not there, and instead a feeling of unfamiliarity, vagueness, and strangeness replaces our mental installation of our everyday places. This relationship highlights the need to evaluate the intersection and interface of media and architecture as a consequence of new technological conditions.

American film theoretician Walley (2003) explains how Eisenstein's montage concept is not limited to the medium of cinema. Rather Walley argues it be a basic cultural principle that could be found outside the medium of film; the film is just the most recent artistic embodiment of the principle of montage. Eisenstein in "the cinematographic principle and the ideogram" has depicted an analogy between montage and Japanese pictographic writing identifying the blurred boundaries of montage as a concept. In his article "Film Form", Eisenstein (1969) claims that principles of this idea existed before the invention of cinema in Japanese visual culture. In "Associational Montage" he argues that two or more adjacent symbols produce in Japanese writing, through their collision, meaning not inherent in either

one of these symbols. Thus, the symbol for eye next to the symbol for water will produce a different meaning of weep, in which two adjacent images or shots transfer a new abstract meaning because of the nature of their juxtaposition, not inherent meaning in any of them (ibid: 28–56).

Conclusion

Due to the emergence of new media technologies in our daily life we are becoming exposed to experience time montage and space montage of film and architecture simultaneously. Architecture mainly becomes the site of interface between reality and the virtual realm. 'Live Montage' occurs and brings cinema and architectural together. Layers of virtuality unfold in an architectural media through mobile devices, screen projections, moving images, public urban game shows, and so forth, where new layers of temporality are thus added to the experience of an urban event. Argued here is that through this new interdisciplinary spatial construct, observer-participants operate inside the system of montage and the previous relations between spectator cinema and place have transformed. As mobile spectators inside the black box of 'live montage,' we can recollect fragments of everyday events and images found in both media and architecture. 'Live montage' starts from focusing on the effects of "moving images" injected in urban spaces and consequently changes the perception of spectators as mobile, voyageur reconfiguring the spaces through their physical movement through space. That movement allows us to look back to examples of architectural spaces as a 'live montage' of viewpoints and filmic perspective received through the eyes of the spectator of the urban explorer and perceived through their mind and eye. This concept is supported by Brian Massumi's and James William's writings on "knowledge in transit" and the qualitative and consistent transformation that happens by passing and experiencing space from one point to another point through transitional gaps. 'Live montage' is not only an inter-relational spatial concept between architecture and cinema. Moreover, it is a real engagement of the two mediums in our daily life. The new type of juxtaposition of mediums (media and urban places) creates and transfers new meanings and experiences that are in fact embedded in neither of them individually.

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Boredom and Space

Christian Parreno

Abstract Boredom appears as cause and effect of the cycle of innovation, as the disaffection with 'the old' that drives the search for 'the new'. It is a state of ambiguity and ambivalence, idleness and restlessness, with a critical and relational essence. Although boredom has usually been described as a negative reaction to the environment, it also generates mental space, in real time, to promote mechanisms of introspection and transgression. The condition instigates experimentation with the ultimate aim to procure transcendence. These characteristics coincide with the paradoxes and contradictions of the modern experience. The overpowering processes of capitalism—industrialisation, secularisation, rationalisation, urbanisation and the consolidation of the nation-state—have resulted in an everyday life characterised by repetition, monotony and habit. Within this context, boredom is not only an index of an alternative sensibility to the values and visions of modernism but also a way of conceptualising history. To facilitate its analysis, three levels, or spaces, of complexity have been identified: the first refers to its structural properties as an individual disorder, the second contextualises boredom as a reality of the modern era, and the third lengthens its temporality as a historical threshold responsible for the possibilities of the future. This understanding is based on a juxtaposition of philosophical and critical elaborations on the modern by thinkers of the twentieth century, including Walter Benjamin, Martin Heidegger, and Henri Lefebvre, and examinations on boredom done in retrospective by contemporary scholars, including Andrew Benjamin, Lars Svendsen, and Peter Toohey.

Keywords Boredom · Space · Modernity

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Introduction

> Adam was bored alone; then Adam and Eve were bored together; then Adam and Eve and Cain and Abel were bored *en famille*; then the population of the world increased, and the peoples were bored *en masse*. To divert themselves they conceived the idea of constructing a tower high enough to reach the heavens. This idea is itself as boring as the tower was high, and constitutes a terrible proof of how boredom gained the upper hand. (Søren Kierkegaard. *Either/Or*, 2004/1843: 228)

Boredom is a condition that, once analysed, can serve to structure almost every spatial circumstance in modernity. This flexibility and ubiquity indicate a circular movement of causality, which suggests that the disaffection with 'the old' is what drives the search for 'the new'. Boredom incites the emergence of operations of introspection and transgression in the attempt to propel transcendence, exceeding the psychological due to its involvement with time, space and matter. As an all-embracing event, boredom is as a topological moment, a mood that entails the experience of contradictory qualities, at once emotional and intellectual, gesturing to something beyond itself.

This presupposes a relationship between the subject and the environment in which architecture constitutes an amalgam of practices and manipulations, generating instances of physical space as well as ideations of space. To explore these articulations, three levels, or spaces, of complexity have been differentiated as frames through which to examine the composing layers and undertones of this interrelation. The first refers to boredom as an individual and isolated occurrence, with characteristics and laws of its own. The second localises boredom within the modern era to contextualise its cultural, social and ideological connotations. And the third discusses boredom as an extended moment that lingers on the present only to reconsider the past and the possibilities of the future, projecting a historical structure. The porosity of these three levels unveils boredom as an elastic and entropic state, in constant flux, mediating between interiority—the space of reason and emotion—and exteriority—the space of society and the world.

Void, Disruption, Expansion

In the series of lectures entitled *The Fundamental Concepts of Metaphysics. World, Finitude, Solitude*, Martin Heidegger portrays boredom as a pervasive indifference to the constant pursuit to find a space to dwell in the world (1995/1929–30: 160–65). Extending this depiction, boredom can also be defined as a spatial reaction characterised by sensory overload and sensory deprivation, with attendant 'anxieties of excess as well as anxieties of loss' (Petro 2002: 61). Studied by psychology as a minor ailment since the 1890s, the condition has been posed as a question concerned with the nature of attention, concentration, focalisation and distraction, problematizing the origins of motivation through the capacity of the subject to establish connections with the environment (ibid: 62). As a symptom of

disengagement, boredom befalls when the qualities of the surrounding events do not offer options for satisfaction or significant fulfilment (Fenichel 1951/1934: 350–51). It interrogates: to which sources of stimulation should the individual relate and respond?

Boredom is 'a hybrid, partly subjective, partly objective', depending on the outside and its processes to exist and become manifest (Heidegger 1995: 87–8). Although its inception can be located in the interior and the exterior of the subject, in all cases it results in a qualitative disruption—the immediate architecture is perceived as empty and dismal. Far from experiencing stimulation as potential excitement, the subject censures the environment for not providing opportunities for gratification or emotional discharge. If the world cannot be the object of desire or attentive perception, then it is not possible to turn towards its offerings with interest (Schachtel 1959: 233). The outcome is an involuntary deficit of meaning that does not belong and cannot be attached to any place or location.

Boredom as Void

The term 'boredom' carries in its etymological origins a spatial reference. According to the *Chambers Dictionary of Etymology* (Barnhart 1999) and the *Oxford Dictionary of English* (Stevenson 2010), 'boredom' was coined in the nineteenth century as the combination of the verb 'bore' and the suffix '-dom', both from Old English. The first component means 'to make a hole by drilling a solid', and the second forms nouns associated with specific domains. Firstly recorded in novels such as *Women as They Are, or The Manners of the Day* (1830) by Catherine Gore and *Bleak House* (1852–53) by Charles Dickens, 'boredom' denotes a void space where a component of the whole has been removed due to an involuntary action. The zone of the missing piece lacks any quality because there is no indication of its original characteristics, being accessible but undefined, without distinction between interior and exterior. Moreover, the boring and the interesting tacitly imply one another. The latter derives from the Latin 'interesse' that signifies 'to be between'. Correspondingly, the existence of a positive object in the negative space of boredom implies that absence is dependent on presence; that is, 'without the concept of engagement, disengagement has no meaning. Interesting means not boring; the boring is the not interesting' (Spacks 1995: 116).

Nonetheless, it is not only the etymology of boredom that denotes its spatial quality. Several writers and existentialist philosophers have employed the condition to explain vacuity and bareness. In *Zibaldone* (1821), Giacomo Leopardi described boredom, in Italian 'noia', as 'daughter of null things, mother of the void' (1991: f. 1815). In 'The Vanity of Existence' (1891), Arthur Schopenhauer declared that this state, in German 'Langeweile', is the 'direct proof' of the 'emptiness of life' (2007: 22). In *Boredom: A Psychological Study* (1903), Émile Tardieu presented boredom, in French 'ennui', as a 'disease of nothingness' (1913: 136). These negative qualities render boredom as a hollow space waiting to be occupied, indifferent

to the restrictions of form but as 'pure possibility' (Teyssot 1996: 48). It denies any specific or complete configuration, remaining uniform, formless and multiform—like a designed mishap (ibid: 48).

Boredom as Disruption

Boredom is not only characterised by the unfulfilled desire for desire but also by the interruption of the trajectory of desire. As an interference, the condition has been described as 'psychic anorexia' (Healy 1984: 60). Despite the need for significant emotional or intellectual sustenance, the bored subject cannot be nourished from the attributes and suggestions of the environment. In contrast to the elevated associations of 'noia', the temporal reference of 'Langeweile' and the elitist tone of 'ennui', boredom figures as an intrusive malady rather than as an awaited inspiration (Petro 2002: 62). The *Reader's Digest* wrote in 1976 that boredom had become 'the disease of our time' (in Healy 1984: 36). A West German study of 1981 showed that between 1952 and 1978 the percentage of the population who found boredom 'a great problem' increased from 26% to almost 50% (in Spacks 1995: 3). And according to an online survey conducted in 2009 by the commercial organisation 'triviala.com', the average resident in the United Kingdom suffers from boredom during approximately six hours per week. That equates, over an average lifespan of 60.5 years, to more than two years of being bored (in Toohey 2011: 2).

The obstruction of the flow of everyday life generates mental idleness and corporeal restlessness, threatening the achievement of satisfaction. Boredom impedes pleasure and the continuum of tempo-spatial rhythms (Csikszentmihalyi 1975: 54). As a result, not only attention deficiency and the inability to engage with the surrounding events arise but also agitation, disorientation and confusion—a bored subject bored can become estranged and unreasonable.

Boredom as Expansion

Although boredom favours introspection, it also encourages physical movement, acting as a justification for the expansion and conquest of new geographies. Similar to the inconformity with destinations described in antiquity by the Latin 'horror loci', the need to constantly vary spaces of inhabitation tests if the source of boredom is a failed engagement with the environment. If this is the case, then the subject turns to the exploration of new territories—as Søren Kierkegaard points out in *Either/Or* (2004/1843: 233):

> Everyone who feels bored cries out for change. […] One tires of living in the country and moves to the city; one tires of one's native land, and travels abroad; one is *europamüde*, and goes to America, and so on; finally one indulges in a sentimental hope of endless journeying from star to star.

Voyages with similar intentions are frequent themes in late-Victorian and early modernist novels of colonialist adventure (Kreisel 2006: 22–8). The protagonists of these stories become bored with everyday life and, with the aim to redirect their attention, they start extensive expeditions. In *She: A History of Adventure* by Henry Rider Haggard (1886–87), *Kim* by Rudyard Kipling (1900–01), *The Moonstone* by Collins (1868) or *A Passage to India* by Forster (1924), boredom is expounded as an asphyxiating, confined and dehumanising space (ibid: 22–23). The condition serves as a metaphorical demarcation between the brute and the human—as an analogue relationship between a bored subject and an interested one, or as the difference between instinctive automatism and reasoned movement (ibid: 29–30). Consequently, boredom not only had to be avoided by constant travelling—a pathology named 'dromomania' in late nineteenth-century France—but also by following the conquering processes of Western civilisations. The passion for the discovery of uncharted locations, in turn, secured the establishment of habits of modernisation in the newly colonised places, perpetuating further cycles of boredom.

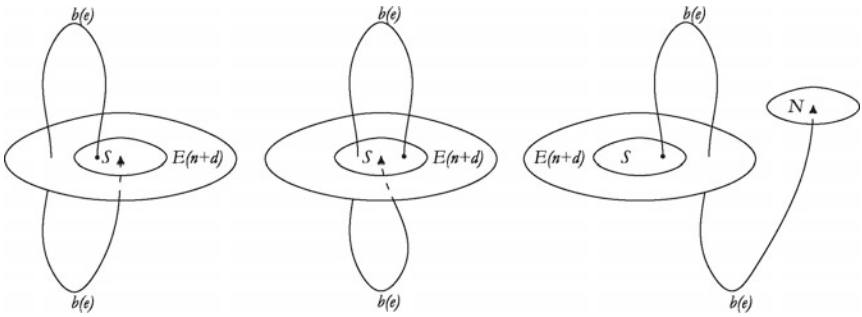
Spaces of Boredom: Individual, Modern, and Historical

Boredom problematises the experience of space since it questions activity and temporality. This capacity to operate in almost every aspect of existence entails a conception of space as process and in process, as a dynamic relationship between the subject, the environment and the perception and understanding of time. Boredom implicates intensity as well as extensity. It is concurrently multi-spatial and poly-formal, individual yet social and cultural, entrapped in the present but preoccupied with history and the events of the future.

Individual Boredom

Boredom seldom exists in independence from another term or set of concepts. At once physical, emotional and intellectual, it is a signifier that fluctuates and attests to articulate a subjective experience delineated by objective settings. The properties of boredom are not exclusive of boring objects or bored subjects but constitute a critical investigation into the essence of spatial engagement: to what extent and under which circumstances is the subject willing to respond to the immediate environment? How many sources can be of interest? Which ones are meaningful?

If boredom is visualised as a trajectory that begins in the subject, then three main variations, or typologies, can be distinguished (Fig. 1). The first type is triggered by exterior circumstances; if the subject (S) is an agent located in the environment (E), then boredom crosses this field only to return to the origin. The condition will



Exterior boredom Interior boredom Exterior-interior boredom

S = subject; *b* = boredom; *e* = experience; *E* = environment; *n* = nature; *d* = designed environment; *N* = new

Fig. 1 Types of boredom (*Source* Parreno 2012)

ultimately disappear once the external circumstances have changed. It is the kind of boredom experienced in waiting rooms, train stations, airports and classrooms. This typology includes satiety, repetition and excess of the same. The second variation is indifferent to exterior circumstances as it appears in the interior of the subject only to stay there and initiate a process of introspection. Unlike depression, this type of boredom results from the absence of communication with the outside world; the environment is analysed only to be negated. Boredom persists despite the change of exterior circumstances, with the risk of becoming existential. The third type can stem from interior or exterior circumstances but forces the subject to react and produce the new (N). It conducts an exchange of information that engenders a negative or positive difference—in the form of obliteration and stasis or innovation and creativity.

This paucity of a narrative of its own exposes boredom as a mood. Dissimilar to the specificity of emotions, such as happiness, frustration or guilt, moods are long-lasting, with constant intensity and less likely to be triggered by isolated events. They connect the psychic with the body and the environment, indicating how the subjects are in the world by disposing them in a particular manner—the inhabitation of space is conditioned by these ontological structures (Heidegger 1995: 59–68). Furthermore, boredom is not a by-product of other human faculties, and thus it cannot be eliminated through concentrated effort (Thiele 1997: 497). The condition is a moment in the oscillation from one state to another.

During this continuum, boredom strengthens the fixation with the production of new objects, interceding in the ongoing negotiation between the subject and the outside world. Based on the creation of the novel, this relationship involves an indetermination of desire that perpetuates the pursuit of gratification and fulfilment. One of the tasks of boredom is to construct demands that cannot be satisfied. If the object of desire does not exist, then boredom creates the illusion that it can be imagined, materialised and eventually consumed.

Modern Boredom

The characteristics of boredom as an individual structure are also properties of the modern experience. With the emergence of the modern era—assumed as the period from the Industrial Revolution to the present—the actions and reactions of the subject fostered new habits, pragmatic rather than ritualistic. If the principles of modernism, including science, technology, democracy and liberty, are isolated, then processes of modernisation that promote progress can be identified. Capitalism, industrialisation, secularisation, rationalisation, urbanisation and the consolidation of the nation-state organised an everyday life of monotony, following a linear sequence of daily activities—working, commuting, resting.

Within this arrangement, the majority of the population was left to adjust to a standardised way of life, with the aim to secure the private ownership of the means of production, the creation of goods and services for profit, the accumulation of capital, competitive markets and wage labour. The procedures of capitalism were conceived to favour the logic of the assembly line (Highmore 2001: 6). This type of production enforces the regular rhythm of mechanical systems, maximising output although making the experience of the worker partial and disconnected not only to the overall system but also to the natural and built environment. Although boredom is not exclusive of industrial activities, it mainly surfaces in moments of similar nature due to their impersonal repetitiousness—as Karl Marx observes in *Capital* (1976/1867: 548):

> In manufacture, the workers are the parts of a living mechanism. In the factory, we have a lifeless mechanism which is independent of the workers, who are incorporated into it as living appendages. […] Even the lightening of the labour becomes an instrument of torture, since the machine does not free the worker from the work, but rather deprives the work itself of all content.

As an instrumental component of progress, natural time was replaced by the division of the day in equal units. The monotonous cycles that emerged from clocks intensified the polarisation between subject and nature. As such, the modern conception of time transcends all subjective elements; it is equal, rational and common to all. Correspondingly, working and living spaces were designed around this new temporality, contributing to the routinisation of the everyday. In 'The Metropolis and Mental Life' (1903), Georg Simmel notes that the homogeneous succession of daily activities conflagrates with a variety of chronometric devices to aggravate boredom and install punctuality, calculability and exactness as requisites of the modern life (1971: 13). The interiorization of the discipline of mechanical time perpetuates the present as an infinite and seemingly neutral space, defining the field of action of modernity.

When cities augmented in size and were consolidated as economic and administrative centres, they became the locus of the quotidian—of the circular movement from boredom to distraction. In 'Notes on the New Town' (1960), Henri Lefebvre distinguishes two types of boredom according to the historical development of Navarrenx, a medieval town, and Mourenx, a post-war settlement. The first

is attached to Navarrenx, portrayed as 'always boring' due to its idleness and the recurrence of natural and social cycles. This boredom is 'soft and cosy […] like Sundays with the family, comforting and carefree' (1995: 118). The second type is modern, present in both towns. In Navarrenx, the incessant construction of the new and the selective preservation of the old have turned the city into a wasteland, invaded by cars, lorries and industrial noise. This moment is restless, repetitive, vain, predictable and 'just boring, the pure essence of boredom' (ibid). In Mourenx, 'everything is almost a hundred percent redundant. […] The text of the town is totally legible, as impoverished as it is clear, despite the architects' efforts to vary the lines' (ibid). As a result, the conceptual clarity of modern architecture curtails spontaneous behaviour, becoming deterministic—to Lefebvre (ibid: 118–19):

> These blocks of flats are also 'technological objects' and machines. Will they be able to provide a new humanism? […] Can they mediate between man and nature, between one man and another? […] Will people be compliant and do what the plan expects them to do, shopping in the shopping centre, asking for advice at the advice bureau, doing everything the civic centre offices demand of them like good, reliable citizens?

Although power and economy collide in the production of buildings, these fail to provide possibilities of civic meaning and individual relevance. Modern architecture appears predominantly concerned with the requirements of capital, manipulating a codified language that commands bodies and regulates space (Pile 1996: 212). This construct requires centralised sites of assembly, systems of communication and transport, and the institutionalisation of laws and their implementation. By stressing functionality, the message of architecture is trivialised.

In addition, the same machinery of progress, responsible for mass-producing inescapable conditions of boredom, provides a corrective solution: a cultural world of entertainment and pre-arranged excitement. Cinemas, theme parks and resorts, stadiums, museums, galleries, schools and universities have proliferated since the late nineteenth century. However, boredom is not the only outcome of banality; it is also a critical refusal—as Siegfried Kracauer affirms in 'Boredom' (1995/1924: 332):

> [Being bored is] the only proper occupation, since it provides a kind of guarantee that one is, so to speak, still in control of one's existence. If one were never bored, one would presumably not be present at all and would thus be merely one more object of boredom.

The failure to be bored in such environment marks the success of distraction. To prevent this deceptive solution, isolation can induce a profound state of self-absorption. Desire and motivation have to arise from the interior of the subject and not be dictated from external agents. The ultimate goal is to succeed in the world of media, commodity and leisure. Consistently, in the relation between man and the outside world, boredom locates itself in the middle through the technological object, as an intermediary of perception (Svendsen 2005: 87). In modernity, technology, boredom and entertainment have evolved as codependent agents —the presence of one is destined to increase at the same pace established by the other two.

Historical Boredom

If the experience of boredom is extended to events chronologically distant, then it can provide a structure of interrelation and organisation capable of enlightening how the future is conceptualised. These possibilities are accentuated by the space of innovation and potentiality that boredom entails—the emergence of 'the new' originates in the tiredness with 'the old'. In this sequence, the present, 'the new', is an outdated future in between 'that which happens' and 'that which fails to occur' (Petro 2002: 57); the past, 'the old new', constitutes an uncritical reference; and the future, 'the new new', is a 'difference yet to come' (Highmore 2001: 2).

The lack of a significant past and the incapacity to create desire in the future positions the subject in a constant present. In *Postmodernism, or, The Cultural Logic of Late Capitalism* (1991), Fredric Jameson argues that the interest in past images and former styles fuels a pervasive sense of a historicity in the present (1991: 71–72). The craving for the actualisation of previously designed aesthetics responds to the need to fill the empty space of boredom—the events of the past supply an endless source of positive material, already scrutinised and with marginal risk of inefficiency. Conversely, in *History and Utopia* (1987), Emil Cioran affirms that history, the recording and classification of preliminary events, is the result of our fear of boredom—the starting point from where the past ought to be investigated (1987: 109). If novelty and innovation represent axial values against inertia and stagnation, then history may serve as a text that indicates what must be avoided. These preoccupations are evoked by Walter Benjamin in the Convolute D 'Boredom, Eternal Return' (2002/1927–40: 115) by quoting Friedrich Nietzsche in *The Will to Power* (1968/1887–88: 35–6):

> Let us think this thought in its most terrible form: existence as it is, without meaning or aim, yet recurring inevitably without any finale of nothingness: the eternal return […] We deny end goals: if existence had one, it would have to have been reached.

By extension, the recurrence of the same in nature and civilisation propounds a cycle of production and reproduction without purpose, unless the circle of history is the object of desire. The principles of modernism that cohabit with the notion of the eternal return constitute 'indissoluble antinomies in the face of which the dialectical conception of historical time must be developed' (Benjamin 2002: 117). In this manner, history arises as the tension between boredom and the interesting—the structure of the present. If the subject experiences boredom when the future is indeterminate, then the interrogation of what constitutes its dialectical antithesis arises. (ibid).

Reflecting on this question, Andrew Benjamin identifies 'distraction' as the opposite of 'boredom', both in circular concatenation (2005: 159–62). Unlike a carefully planned design, this is a speculative and deviating movement from 'what exists' to 'what can potentially exist'. The effects of the present cannot be accurately predicted because boredom operates in the confusion of waiting. Its task is not to calculate the future but to try its options by operating in the front edge of the

now; therefore, 'what must be taken up is boredom as a threshold' (ibid: 162). This space, in between interiority and exteriority, allows forming, evolving and becoming; it supposes ambiguity and ambivalence. Passing through this threshold, 'a crossing in which futurity is introduced as made possible by the present's potentiality', requires disregarding utopias and existing configurations of the future (ibid: 170). Boredom turns into latency—the moment after stimulation but before the emergence of the possibilities of action. Hence, 'the dialectical antithesis to boredom is experimentation; experimentation both as mood and as act' (ibid).

Conclusion

The three identified spaces of boredom—individual, modern and historical—expose a dynamic and relational condition. Resonating with Heidegger's portrayal as a substance with high porosity and capacity of enveloping the subject in an almost visible thickness (1995: 77), boredom moves back and forth from interiority to exteriority, from the public to the private, and from the individual to the social and communal. Its essential qualities problematise the spatial experience in modernity as well as the understanding of the present as a nodal moment in between the past and the potentiality of the future. These fluctuations disclose boredom as a continuous, critical and topological enquiry concerning the physical and mental location of the subject. Therefore, the modes of spatiality that boredom entails turn away from the understanding of space as a realm defined by the objects of architecture to project space as an operation, in continuous change and renovation. The space of boredom is entropic and eventful; it transforms the question 'how do we stand?' into 'how do things stand with us?' (Heidegger 1995: 76).

Consequently, boredom requires being thought in terms of responses, practices and events—a frame that encompasses actions, designs and reactions to the environment. The condition promotes detachment, introspection and experimentation to probe and potentially reshape the nature of spatial engagement. If the modern subject is simultaneously linked to and separated from the world through architectural and computerised surfaces, then boredom not only demands more technology and entertainment but also configures moments of waiting that disrupt the apparent flow of the everyday. However, these voids provide a threshold to speculate about the future and the parameters of innovation.

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Part IV
Sociology and Built Environment

A Street with Informal Regulation

Antonius Karel Muktiwibowo

Abstract Two keywords that are significant in the debate over the occupation of the street and public space are 'formal and informal' activities. It appears that this discussion will continue in urban planning and design as the socio-economic conditions keep changing. It is the notion of urban planning and design that points to the 'informal activities' by perceiving this as an advantage to a city's socio-economic qualities. Hence, informally becomes formal as a recognition of its significance in the urban realm. On the contrary, when formality brings no advantages then informality found its position better and reinforced as a place-maker. The urban theory of the global North cannot directly explain this informality of the East or that of the under-developed countries in the global South due to their significant differences in ethnicity, socio-culture conditions, high population growth with a low level of education and awareness of 'urban rules' of the West. Street space management becomes a tremendous challenge and hence becomes contested in maintaining an urban livelihood. However, the Global South has unique and powerful strategies that can organise the built environment based on stable and sustainable communities. The relationship between the physical, the spiritual human and space, which become one of the key factors in establishing an informal balance of control, power, space territoriality and liveability of street space, therefore, become a major focus of this chapter.

Keywords Street · Contestation · Informal · Control · Territoriality

Introduction

Streets, as elements of the urban landscape and as public space, belong to anyone occupying them. Today, the degree of 'public-ness' (Madanipour 2003) of the street is questionable due to its effectiveness as a functional attribute of the city. In developing countries, high levels of population growth, poverty, uncontrolled

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urbanisation and an increasing number of vehicles create growing problems and complexity for the lives on streets. However, traffic jams and concentration of people bring a positive outcome to day-to-day economic activities, where mostly informal economies are encouraged to grow with the intention of supplying cheap and affordable goods and services to the public who opt to use streets for commuting or walking for urban activities. A busy street space eventually becomes semi-public due to the array of valuable income-generating activities which lead to demand by small entrepreneurs for places of occupation. The question remains of whether a formal rule can be applied, understood, and sustained in this contested space as public realm. Some investigation towards informal activities on streets has revealed that regulating and managing informal activities is not a simple task since the fluidity, and transformability of informal economic activities pose a new challenge for urban managers. It is a difficult task to implement and regulate rules since the 'social capital' that relate to it does not have direct advantage/s or profit gain/s by applying formal regulation (Cross and Morales 2007). Formal urban street planning and regulation defines the function of the street as a transportation corridor as well as maintain the urban identity by emphasising its ordered, easy and efficient traffic patterns. These ordered patterns further define the efficiencies of the urban management. However, the street bears further meanings than merely an access route. It had its specific and localised characteristic with functions and meaning for public, economic and social resiliency and by having a strong relationship between people and street space (Payne and Brown 2010).

Space and Urban Life in the Balinese Community

The relationship between space and urban life is robust and obvious in the Balinese community. This community is a sample from the global south which believes that every little space has its specific meaning and a direct relation to their ancestors or God. The Urban place is no longer considered as a common space, but rather, as rich in meanings which relate to their history, beliefs and ownership. Urban spaces are clearly and socially defined as territorial spaces, between one family and another as well as a group domain. Each territorial space is emphasised by a symbolic temple which is located at the edge of their district to emphasise its border ownership. People who belong to one Balinese group of communities, which is commonly based on family-kinship, have an obligation to take care of their group besides their personal interest and group needs, while other groups of people, who are strangers and not included to their kinship, are not allowed to do so. It is shown in a 'Sanggah', a small temple in the middle of a street intersection, as a symbol of 'Banjar' (Balinese community group), which has been dressed and ritually blessed as a territorial signature and community place of worship. As shown in Fig. 1, one segment of the street (around 1 km) was used for 'Banjar' towards birthday ceremonies lasting for three days to one week and by blocking the street completely. This means that other people cannot use the street and have to find other alternative

Fig. 1 Informal street use and territorial control over Denpasar Street (*source* Efata Ferryka/Author)

routes to reach their intended destinations. This small local group led community event happens so frequently in Bali that it has become an integral part of Balinese public life. While the local authorities are aware of this, they have less control of any public space activities such as the use of the street for religious and/or communal events. The frequency, quantity and involvement of some people in this public space and the local authority's predetermined distance to these crowds so to avoid any conflict and the sensitive issue of religion and cultural respect bring into question the informal use of public space formal and commonly allowed action.

Balinese urban space is not solely a public space which offers freedom of use and access for every person. It is also intrinsically an own territory for a particular group of communities. As already stated, the communal territory is defined using temporal built form as a man-made signature. While this is understood by the community, who build the temporary structures, it has less significance and meaning for groups belonging to other communities. Borders and boundaries of territoriality have a strong signature because they clearly define the segregation and social cognition of such. The Balinese street forms the social definition of the community's area with a specific signature on the street to refer to a particular group possession. However, the physical element is a static entity which can control and communicate actively, similar to traffic signs that inform the road users of control traffic but cannot stop people who choose to disobey the rules of use. Therefore, human agency is still significantly necessary to consider about social norms and patterns of self-regulated mobility that exist in the East.

As the state authority, the police should ideally be the ones that are responsible for managing all the activities taking place in public spaces. However, the challenge

in Bali and most global Southern cities is the quality and deliberation of power exercised by the authorities compared to the number of illegal activities occurring in public spaces. The 'power' of authorities here ideally provides personal protection and manages insurance, money, ethnicity, culture, and religious issues. This is believed to be one of the complex public management problems. From interviews with local authorities it is revealed that the apparent negligence to tackle and manage informal use and illegal activities on the street is due to the inherent lack of financial support to conduct the necessary protection; low budget allocation for fuel and vehicle maintenance; low wages for police; minimum insurance and protection for police; and the deliberate act by the police to avoid any likelihood of social conflict. It is acceptable to use public space for socio-cultural activities as long as this does not pose any harm to other residents or pedestrians. The procedure to organise public events is quite simple. The head of the community is responsible for obtaining permission from the police to use a segment of a street for community religious or social events. With or without the authorization from the police, the community still conducts their street activities on their initiative since any obstruction or rejection to their event/s can only cause community unrest or demonstration. Therefore, permission is unofficially given by default. The presence of the police only safeguards the community's activities by ensuring that no other community members can cause disruption, and this is managed by the community offering payment to the police at a daily rate. The police and the community security group called 'Pecalang' work simultaneously (Fig. 2). The police 'accompany' the 'Pecalang' (who wear a black shirt and plaid fabric) to control an 'adat' religion ceremony being conducted on the main street during the peak hour traffic that often causes 1–2 h traffic jams that can be between 1 and 3 km long.

Fig. 2 Police and 'Pecalang Adat' stop the traffic for 'Ngaben' a Balinese burial ceremony (*source* http://watermelonmom.blogspot.co.uk/2010/12/bali-part-1.html)

This exemplifies the controversy surrounding the freedom of street access as the ceremonies interfere with the use of urban space and bring into question who has the power to maintain and control street activity.

Street Space Contestation

Local street space is an ambiguous public space due to its very nature of allowing a multitude of uses and complex activities, which make the use definition unclear. This leads to the on-going challenges over the spatial quality of streets. There are major issues, such as economic value, social background and the power of authorities related to the social contestation and competition over the use of street space. Although there are still many factors that can influence the vitality of street quality and life, the discussion of three major factors can begin and create the theoretical linkages between street space and urban activity and generate further interest in this subject.

Informal economies and street vendors, which and who are critical components of the urban economy in the South Asian region, are highlighted within the discourse of street use (Brown 2006). It is identified that failure to define street space between public and private leads to the growing number of the informal sectors and the generation of localised economic transactions. The more uncertainty in defining street space and its uses, the more the informal sector will grow and extend to streets and other neighbourhood informal spaces. This high growth of informal economies on the street occurs mostly in poor and developing countries with a high proportion of poverty, a consequence of a lack of formal jobs, education and financial support from the government directly or indirectly to alleviate the situation. The situation is illustrated by the high level of urbanisation in large cities in undeveloped or developing countries. The density of activities and the concentration of population in the major cities increase the value of space and also develop the value of public space including streets as 'economic-free use' spaces. Every community can freely transform open spaces to places that can easily be used to promote an active, productive informal economic sector. The argument presented here is that the public space is for city inhabitants and the informal economies generated on the streets should be permitted because they are operated and managed by public. The key issue is the definition that can be applied to differentiate authorised and unauthorised activities by all actors since the debate about access and privileges over street spaces are still questionable (Milgram 2011: 261). This freedom of public space has also been argued by Madanipour (2010) through the concept of 'publicness' which rests on the definition of public and private characters within public space.

The 'economic' value of the street as a place for 'urban' livelihood is recognised by the government for its importance to overcome the 'poverty' within the communities. Informal activities positively support people's wealth and livelihood. Furthermore, authorities want to do more than accept informal activities on the

street. The local policy and authorities are interested in creating public socio-economic order to gain access to income generated by the informal entrepreneurs and street vendors actively present on the streets (Bromley 1985). This creates another form of economic contestation. Actors in the informal economy must challenge laterally between vendors and actors of the informal sector for space occupation. They must also struggle with the powers and restrictions set upon them the authorities, regulations and actions to extract capital from these informal sectors. This stricter condition often becomes a more political and expensive struggle, as regulating the fluidity; mobility and managing a large number of informal users can produce controversies and social security issues. The informal street vendors are generally from the poor urban minorities in the communities and tend to find an undefined or 'untitled' public space as the cheapest option. As noted, the Informal sector usually allocates some percentage of their revenue to 'informal' regulators, such as the local guardian or community groups who maintain their security. This localised control means that they get the direct advantage of daily security from offering illegal payment, whereas legal payment of government tax cannot guarantee their safety and continuity of their economic activities. It can be concluded that formal rules and practices are difficult to exercise and to convey, while informal approaches are more readily advantageous because of social norms in the local context (United Nations 2009).

In Balinese society, the informal regulators and mediators are called 'Banjar'. 'Banjar' is an active mediator between the government and community. It has a specific structure with some divisions regulating and maintaining all the informal economic and social life in its territory. Although it is recognised as an 'informal regulator', it has stronger power than the local authorities. Banjar is predominantly based on social values, heritage and religious beliefs, which are sensitive and challenging for the government to either intervene with or modify. Through the 'Banjar' system, it is much easier to regulate the informal activities. Cross and Morales (2007) argue that the complete accumulation process between the community, the informal sector and government should be considered to create a 'balanced relationship'. Therefore, the communication system within the social group is vital. However, the term 'balanced' relationship was difficult to operate within in this context where 'Banjar Adat' constantly transforms and readjusts their system to create a balance between 'banjar', the community and the government, which also continuously reshapes and grows along the lines of the transformation of human social-economic needs.

As a communal organisation managing the street space, the Balinese 'Banjar' is highly recommended. Socio-cultural groups can cluster around public, private, semi-public and semi-private spaces, which are different in their cultural domain (Madanipour 2003). Compared with Brown's investigation in four countries; Ghana, Lesotho, Nepal and Tanzania, it can be summarised that the urban informal economy has some constraints in maintaining infrastructure provision, resource allocation, economic framework, social cohesion, security provision and government regulation. Socio-cultural norms related to ethnicity, religion, caste and gender can dictate social constraints which regulate and control access to urban spaces.

Security refers to the vulnerability of the informal sectors regarding street crime, harassment and illegal fee-financial gains and practices. From the comparison of case studies, it is evident that the government still has little focus and power to balance urban management that can control civic activities on the streets. This lack of control illustrates their inability to manage the urban space that could enhance the street livelihood while delivering the poverty reduction strategy. Therefore, it can be argued that the importance of street traders and the urban informal economy should be considered pragmatically taking into considerations their positive consequences rather than their negatives. Moreover, creating a balance of the obligation and responsibilities associated with the informal activity is necessary because it can ensure and promote vital, transparent governance by giving equal voice to street traders, who are collectively involved in a detailed urban policy of registration and licensing. This informal arrangement creates a system of payment for urban space and a transparent management system of urbanism. It improves the sharing control over public space and provides the street traders with a basic infrastructure, maintaining the municipal market culture, recognising trade association and reducing conflict and enhancing resolution for an equal public voice (Brown 2006).

Control and Territory

The activities on the street are related to the degree of territorial control. Porteous (1977) defines a territory as exclusive control of space by an individual or group, which can set the usability, accessibility, security, and privileges of space. It is expressed and maintained differently among different societies (Lang 1987). As a public territory, the use of it should be accessed by the public (Sarwono 1992). Urbanisation, poverty, high population, and economic opportunity in open spaces are some of the factors that transform the 'freedom of use of streets'. If there are excessive and diverse actors and activities on the street, they also raise uncertainty of who has the right and control over streets.

The Balinese street has a 24-h vibrant life, which is related to the traditional system of everyday Balinese life and is mainly based on the tourism industry. Shift workers, morning to night markets, 24-h shops, food vendors are interrelated and create a lively streetscape. A busy street means a high economic value. Other ancillary activities like streetcars and motorcycle parking are organised and controlled by informal agents who maintain an 'uncertain' revenue sharing system with the local government. This system results from the lack of scrutiny of the recording methods used by the local authorities. There are also issues of a conspiracy by certain authorities, and unclear parking regulations. Besides parking, left over spaces on the street are in high demand for informal economic activities, where informal regulators control accessibility, supplying another added income to the 'informal' regulators. Busy street space has a strong economic value that creates another case for aggression (Bell et al. 2005) and competition of territoriality between 'informal' regulators who try to secure the most 'strategic and money

generated' places as their personal livelihood areas. Access and control, which complicate the street life, have a positive impact on the social atmosphere of the street. As many users are watching it, it is easier to be defined by street users representing insiders and outsiders of the street community (Loukaitou-Sideris and Ehrenfreucht 2009). When the definition of territoriality—regarding the physical and the social—is evident it is likely to create a safer and controlled street environment.

The Balinese community is rich in traditions, which are expressed, maintained and organised through the daily economic and social activities of its communities practised as a form of respect to their ancestors. This awareness of human and spiritual social value also strengthens the community mindset, which protects the Balinese from the outsiders who try to interfere or alter their lives. This social segregation is maintained by the local socio-economic groups (United Nations 2008). However, this spatial street experience with socially controlled norms can create a clear separation of community groups and is a fundamental feature of informal regulators and their power domination (Tilley 1994). This form of territorial control should be maintained as it is related to street livelihood and Balinese identity.

Carmona et al. (2010) compares some theories from Jane Jacobs, Oscar Newman and CPTED about the relationship between territoriality and the control of activity in space (Fig. 3).

As shown in Fig. 3, it can be concluded that territoriality in Bali is considered more socially-based, with the active involvement of the community as a territorial control or safeguard. The cooperative relationship and territory group awareness are stronger due to the social recognition of interrelated users. The community has an active role in defining the access of outsiders and their use of street space. As Berkowitz et al. (2003) argues, it is a strong positive public control that can be determined by social, respectful behaviour, privacy, politeness, all of which varies among different cultures. Discussion about territoriality is essentially an examination of the control of space use and access and relates to the physical and social settings. The process of classifying serious crime and outsider's activities are required to maintain the vibrancy of street life.

Urban Informality

In 'Urban Informality: Transnational Perspectives from the Middle East, Latin America, and South Asia' Roy (2005) argues that informality has been understood as a subject of regulation, and defines it through legal, formal or informal aspects. Multiple and reciprocal relationships between structured and informal are not entirely demarcated. The connections between these spheres may be complex, leading to a debate on legality and illegality. The issue is not about the formal-informal relationship but rather the differentiation of informality where informality is not a separate sector (ibid.).

	Jane Jacobs	Oscar Newman	CPTED	Bali-Indonesia
Territoriality	Clear demarcation between public and private spaces	Territoriality-capacity of the physical environment to create perceived zones of regional influence (including mechanisms symbolising boundaries and defining a hierarchy of increasingly private zones)	Natural access control aimed at reducing opportunities by denying access to the crime target. Territorial reinforcement using physical design creating or extending a sphere of influence so that users of a property develop a sense of proprietorship	Territoriality based on informal use and control by a local 'informal' guard. Checking and organised of all daily activities together with active monitoring and information from social community network
Activity	Sidewalks need users on it fairly continuously, both to add to the number of effective eyes on the street and to induce people into buildings along the street to watch the sidewalks in sufficient number	Rejects the argument that more activity on the street and the presence of commercial uses necessarily reduces street crime	Argues for reduced through movement and hence reduced levels of activity	Sidewalk and street are the communal territories. Safer environment based on tight control of who uses and accesses space. The concept of insider and outsider are clearly defined

Fig. 3 Comparison of territoriality definition and environment activity/security (Carmona et al. 2010)

Informality cannot be considered negatively since its presence is integrated and has a major role in the urban accumulation process (Roy 2005; Cross 1998; Portes 1990). The term 'ambiguous' is implicitly shown in the government's inability to manage this sector (Fig. 4). As a formal regulator of everyday activity in their area, the state is presented the challenging task of dealing with informality. The main

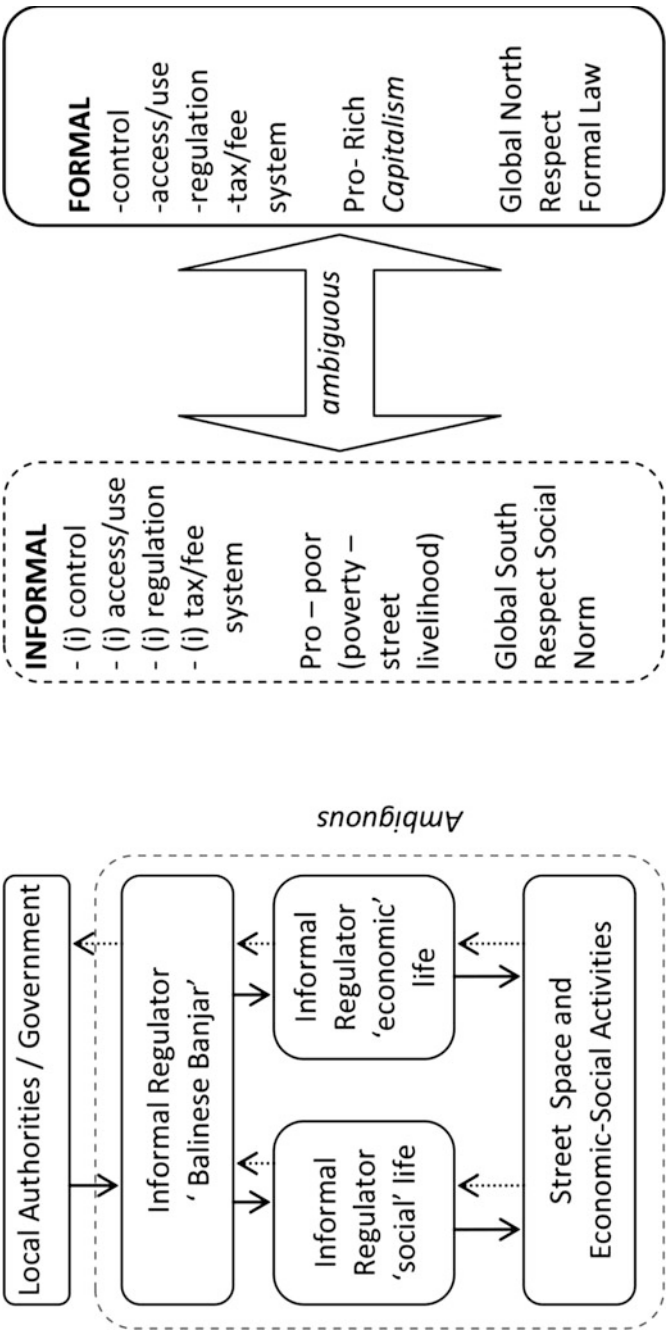

Fig. 4 Bali-Informality of street territorial control (*source* Author)

difficulty is formalising the informal, which requires enormous effort and cost. Conversely, the informal has a major role in supporting the formal through a 'reciprocal fuel relation' (Misztal 2000). For example, direct formal regulation of street vendors can only be effective temporarily since the fluidity, mobility and transformability of street vendors are dynamic and restores itself as a self-healing process. They can be ordered and regulated only when there is a consistent formal force and control. However, when the precise control stops operating, then informality returns and resumes in its unregulated state. Implementing formal regulation is a complex task, which becomes more difficult when taxes and regulatory costs need to be collected. This difficulty is due to the tendency to avoid and reject payments by casual space users (De Soto 1989). The statement—'One obeys the rule when the interest in obeying it predominates over the interest in disobeying it' (Cross and Morales 2007, 46), thus, applies in this situation. A strict taxing system can only sustain formal regulation. The presence of free control and regulation should be considered positively as a mediator between the authorities and the 'poor' community.

The informality of street space power is recognised as an unregulated and illegal phenomenon. Nevertheless, with the complexity and a huge number of informal activities, actors, objectives, ethnic, cultural background, motivation and language has come more free control, and the challenge of regulation which requires local, contextual and sophisticated forms of social ordering (United Nations 2009). A positive perspective of private/informal regulation has the power to regulate informal activities. Urban management should consider this as an integral and inherent consideration towards community planning.

Conclusion

The term informality has been discussed mainly regarding distinct political objective and outcome. The knowledge base, history and experience of the global north tends to value informality negatively because it deviates from a strong and fix concept of an ordered legal and management system. Defining and distinguishing between legal-illegal activities and creating other dichotomies in public practice in the global north city has been applied efficiently. However, the successful approach and theories of the global north are not directly applicable to the organisation of urban life in the global south countries, which face a significant difference in economic and education levels and who struggle to overcome poverty and corruption. The inability of the global South to understand and appreciate the existing theories and practice of the global north to overcome any complexity of urban problems is likely to be the critical deficiency.

Managing complex street life in the global South has been successfully achieved through the presence of informal regulations. This informality successfully regulates street life vibrantly and actively. Some factors support the successfulness of informal regulation, such as norms, ethnicity, religion, kinship, and other local

social characters that can easily define and differentiate insiders and outsiders of the community and facilitates territorial control and supervision. Informal regulation may suffer from a similar weakness as formal regulation if it does not possess full dominance and continuous control, the two key attributes in demonstrating the power over space. Other key attributes to the success of a local community-based regulation are based on how the processes are made active, well understood by all street users, kept low-cost for operators. In conclusion, it is a huge challenge for formal authorities to regulate complex informal urban life without considering and adapting some strong factors derived from informal regulation. Ultimately authorities should create a mutual bond of cooperation with informal regulators in streets as mediators and users of the street.

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‘Kampung Kota’ as Third Space in an Urban Setting: The Case Study of Surabaya, Indonesia

Rully Damayanti

Abstract Lefebvre (The production of space. Blackwell Publishing, Victoria, 1974), Bhabha (The location of culture. Routledge, London, 1994) and Soja (Thirdspace; journeys to Los Angeles and other real-and-imagined places. Blackwell Publisher, Oxford, 1996), classify the condition of urban marginality as a ‘Third Space’, which is an expression of the ambivalent reality of urban wealth in a city. Marginality in urban settings is represented through urban slums, a phenomenon that is usually driven by poverty and the unregulated occupation of urban space, which most cities in the East face. The chapter will compare approaches of First and Second Space related to the creation of ‘Third Space’, especially the notion of the ‘Third Space’ through the inner-city village of ‘Kampung Kota’ in Surabaya. It is neither a real slum nor is it regarded a poor area; the houses are permanently built and have legal ownership or tenant documents. Although located in the centre of Surabaya ‘Kampung Kota’ exists between urban and rural, hence alluding to the notion of the hybridization of the social, as characterised by the ‘Third Space’. While the existence of ‘Kampung Kota’ brings benefits the city (it is the home of service industry workers mostly working in the central city area) it is also under constant threat as the location has high land value leading to ongoing negotiations and insecurity for the residents. The chapter also explores threats to and the possible prospects for ‘Kampung Kota’.

Keywords ‘Third space’ · Kampung · Post-Colonial · Marginality

Introduction

Marginality in the Third World in an urban setting is usually associated with slums, the informal and the poor (Lim 2008). The current condition of ‘Kampung Kota’ in Indonesia is strikingly different to the slum area. The terms ‘Kampung’ and ‘Kota’

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are Indonesian words both meaning respectively village/rural and urban. This chapter uses the phrase 'Kampung Kota' to refer to its originality of dialectic that mostly occurred in Indonesian cities; rural and urban. Historically, Surabaya city was initiated by many villages or kampungs that emerged as a town. Since the Dutch colonisation, the development of the city has mainly focused on the area around and along streets. The grouped kampungs have survived on locations inserted among streets in the urban area (Basundoro 2009). 'Kampung Kota' experiences the dialectic of the social conditions, regarding history, society and spatiality. The theoretical context for understanding 'Kampung Kota' is developed here through reading on the Production of Space by Lefebvre (1974), Bhabha (1994), and Soja (1996). Space is understood not only by its physical characteristics but also in terms of time and society whose power creates the space. The term 'Third Space'; sometimes referred to as the 'Other', reflects the condition between, or compilation of, the First and Second space: the Western and the Eastern world, the Colonial and Post-Colonial paradigm, and also the urban and rural social condition.

The condition of 'Kampung Kota' in Surabaya based on the Triad Spatial Concept by Lefebvre and Soja: historically, socially and spatially. The approach also compares the First and the Second space condition of the case study to define the unique characters of 'Kampung Kota'. The significance of the research is to highlight the difference in exploring urban phenomena in the Eastern and Western worlds. The current approach to urban design and planning in Eastern cities mostly comes from Western ways of thinking, which bring destruction to the existence of 'Kampung Kota' since the Western (classical) approach does not recognise urban marginality.

Space Production

The writings on the Production of Space by Lefebvre, Bhabha and Soja, are used here to compare three positions of 'Third Space'. Bhabha and Soja use the phrase 'Third Space', while Lefebvre gives a concept of spatiality, which includes the character of 'Third Space'. The three authors focus on space as a product of social and cultural actions. Lefebvre develops a philosophy of space as social production based on power and functional capabilities (such as religion and politics), while Soja focuses on a triad of human sensibility (history, social, spatial). Bhabha highlights subject positions regarding cultural identity as a starting point to distinguish colonised and post-colonial approaches. The three authors define 'Third Space' about cultural identity, seeing it as a determining concept of marginality.

Space is understood not only by its physical characteristics but also in terms of time and society whose powers create the space (Soja 1996). Space, or the social space, is not identical and is a process (Lefebvre 1974) made by society with their cultures of multiple elements, histories and subject positions (Bhabha 1994). Space, or in this case urban space, should be understood as a product of society and history. In the case of 'Kampung Kota,' this is seen as a strong dialectic between

Modernisation and Traditional social life (Harjoko 2009). History, society and culture are major factors in creating the space of 'Kampung Kota' (Cote 2011).

The phrase—'Third Space' or the 'Other' reflects the condition between or compilation of the First and Second space: the Western and the Eastern world, the Colonial and Post-Colonial. Specific characters of the Eastern city give different meaning in reading urban space to the Western city, mainly because of the difference in history and society. A colonial city is a spatial product of a civilising mission representing the violence of colonisation (Hernandez 2010), which is characterised by its plural society regarding racial, cultural, and religious value (Yeoh 2003). Bhabha (Hernandez 2010) and Yeoh (2003) highlight the dialectic in reading space and architecture, while Soja (1996) does not focus on the dialectic, but more on the three sides of human sensibility to read a space: space, history and society; or the First, the Second and the 'Third Space'. Contemporary issues of urbanism also give different cultural character to the Western and Eastern city, particularly issues of industrialisation and urbanisation.

Characteristics of 'Third Space'

To understand the characteristics of 'Third Space', it is important to define the spatial concepts of the First and Second space. Figure 1 compares the features of the First and the Second Space that divides into four categories: Dualism Context; Built Form and Space Character; Process of Industrialization; and, Society and Culture. The categorisation is developed mainly from grouping similar characteristics mentioned by authors who have discussed space production and the Post-Colonial Paradigm.

There is a contrast of views of and the reasons for the creation of 'Third Space'. The Third Space is understood by two approaches: in-between the two other spaces (Hernandez 2010), and the new possibility of approaching space production that is sometimes both similar or strikingly different (Soja 1996; Lefebvre 1974). The second position includes the first position's approach. The second method represented in the table (Fig. 1) in Grey, is Lefebvre's and Soja's theory known as 'Triad Conceptual Space'. 'Triad Conceptual Space' connects physical/perceived space to mental/conceived space to social/the space of representation, or First-Second-Third space. In understanding the case study of Surabaya, both approaches will be used to keep an open view.

The detailed character of each position referred to the 'Triad Conceptual Space' of Lefebvre and Soja is explained in Fig. 2. The 'Third Space' presents a new possibility to understand and analyse space, due to its spatiality, history and societal link. The three dimensions will give new insights and unveil the real meaning of spatiality. Lefebvre and Soja give emphasis to the study of marginality, regarding the social product by illustrating the case study of 'Kampung Kota' in its marginal position—socially and culturally—in Surabaya city. In tracing its character, it is important to observe spatial functions in the area regarding everyday life (First

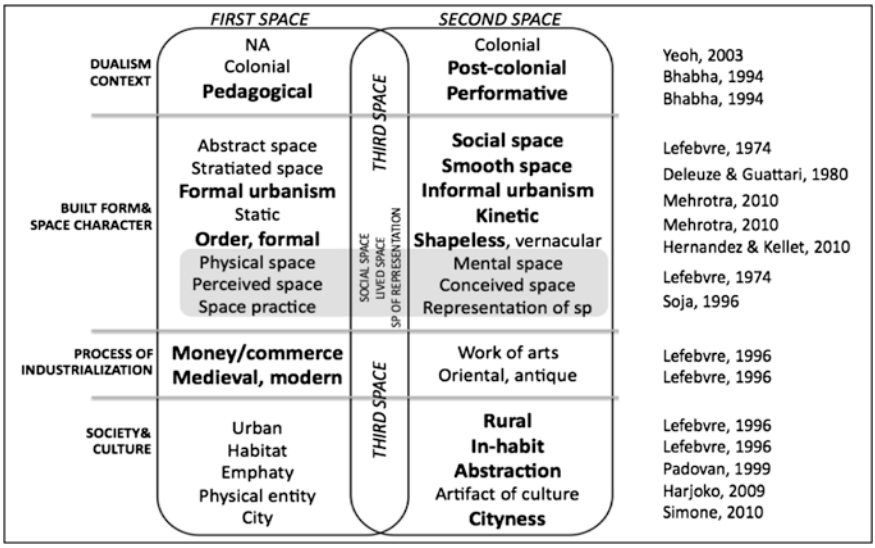

Fig. 1 The 'Third Space' comparison (*source* Author, provide date)

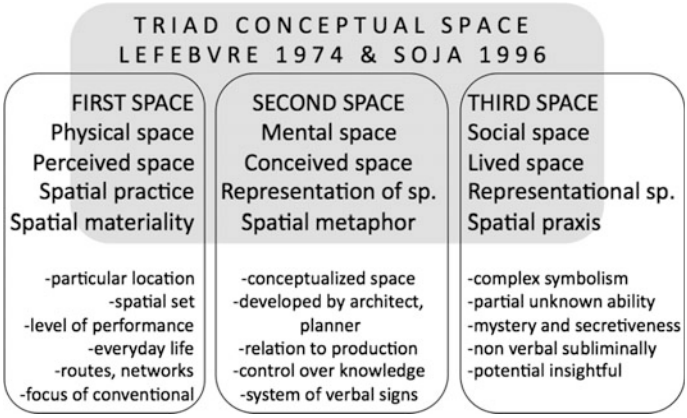

Fig. 2 The 'Triad Conceptual Space' (*source* By Author, provide date)

space) and the official plan of the area (Second space) to understand the cultural symbols of the city as interpreted by the inhabitants ('Third Space').

'Kampung Kota' in Surabaya

Kampung and Kota are Indonesian words which mean 'village/rural' and 'urban' respectively. According to Kresno Murti (2011), there has been unclear evidence on where the word Kampung came from and when it was first used, but in Dutch

colonisation, there was a program named 'Kampung Verbetering' which referred to kampung improvement. Here the phrase 'Kampung Kota' is used to refer to its rural-urban dialectic that has similarly occurred in most Indonesian cities. Indonesia is an archipelago country that covers thousands of ethnicities and traditional villages (kampung). Historically, social practices in traditional villages are the main generator in changing society and living spaces, represented through conditions and relationships of human individuals or groups (Harjoko 2009). Villages emerged to create the city, which was usually under the control of specific social practices such as a kingdom, to strengthen the economic power of the area and empower the kingdom (Handinoto 1996).

Surabaya is the second biggest city in Indonesia (Fig. 3), with a population of 2,765,908, the size of 374.78 km^2, and density of 7400/km^2, based on the 2010 census. Surabaya city is more than 700 years old. Villages located near the Kalimas River are the original parts of the city. Due to Dutch colonisation, these villages grew larger and larger. In the colonisation era, Surabaya became strong in the maritime and business sectors as the main port to deliver spices from the hinterland to the outside world, and vice versa (Handinoto 1996). Nowadays, after more than 700 years, the existence of the villages, which is represented by 'Kampung Kota', gives significant meaning to the city, culturally and economically. 'Kampung Kota' are scattered in and around the central city. As seen in Fig. 4 there are numbers of 'Kampung Kota' in Surabaya, with some of the names referring to specific ethnic groups, jobs, and characteristics in nature (Basundoro 2012a). In the Dutch era, clustering settlements based on ethnicity was one town planning strategy used to control the city, with kampungs emerging as settlements for indigenous people (Basundoro 2009). Besides the native people, the current inhabitants of the

Fig. 3 Location of Surabaya (*source* By Author—interpretation of http://maps.google.com, accessed 04 April 2012)

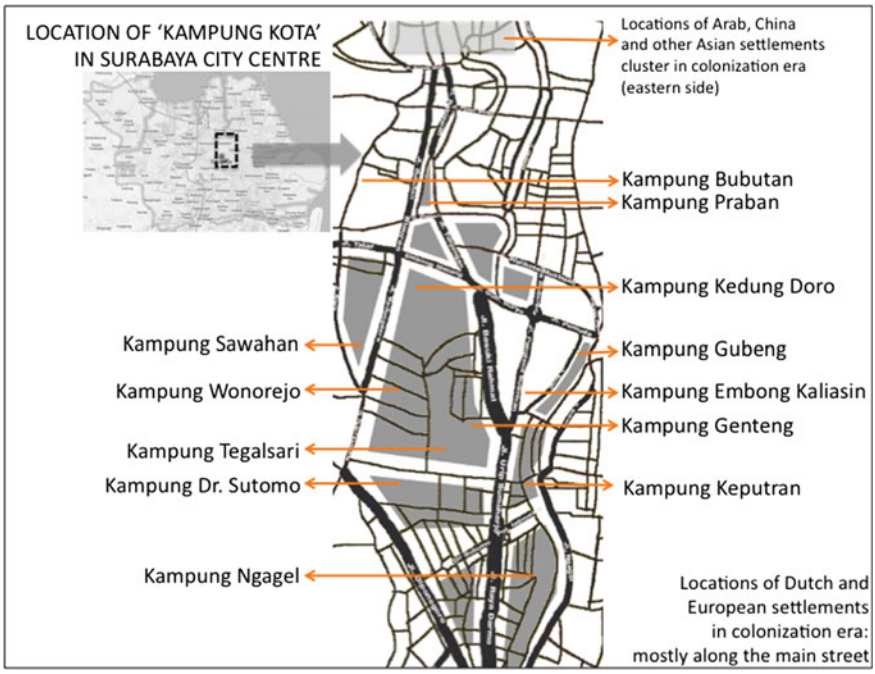

Fig. 4 Location of Kampung Kota in Surabaya City Centre (*source* By author interpretation and http://maps.google.com, accessed 04 April 2012)

'Kampung Kota', are migrant individuals who work in the city centre and who are less able to afford formal houses on the periphery (Pieters 2011). Figure 4 also shows the scattered locations of 'Kampung Kota' inserted in the central city.

'Kampung Kota' as 'Third Space' in Surabaya

Understanding and reading cities in the Eastern world occurs under the umbrella of the Post-Colonial Paradigm. Bhabha (1994) states that understanding the social worlds is always ambivalent: no entity is pure and the diversity increases creating hybridity. Learning about marginality in 'Kampung Kota', should be related to the past (as pedagogical learning) and the current condition (as performative learning). The phenomenon of 'Kampung Kota' always refers to the history, dynamic growth and the social life of the city (Cote 2011). 'Kampung Kota' was the embryo of the city (Figs. 4 and 5) and has now become the main location of housing for city workers because of its accessibility and relatively cheap land value.

In terms, its built form and the spatial characteristics 'Kampung Kota' is similar to informal cities, commonly known as slum areas. Still, the formality and legal ownership of properties in 'Kampung Kota' differs from the character of the slum.

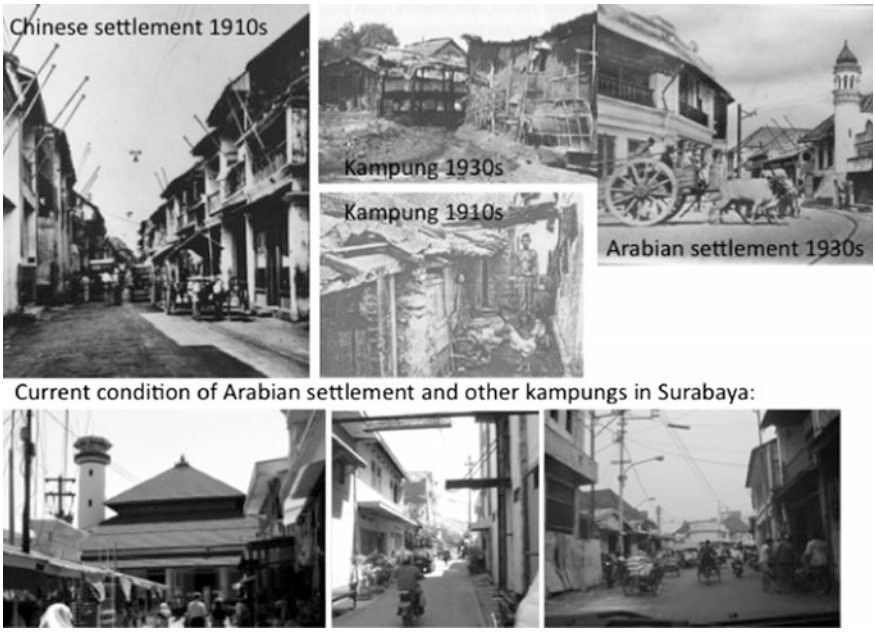

Fig. 5 *Photographs* of old and current 'Kampung Kota' (*source* http://www3.petra.ac.id/surabaya.memory, accessed on 04 April 2012 and Basundoro 2009)

Most of the houses in 'Kampung Kota' have legal documents of ownership (Pieters 2011). Therefore, its position in-between the First and the Second space becomes clearly definable.

According to the Surabaya Master Plan of 2010, the location of some of 'Kampung Kota' will be changed from residential use to commercial purposes, and will become vertical social housing (Fig. 6). It made the position of 'Kampung Kota' formal and ordered, In some parts of 'Kampung Kota', especially along the paths reconstructed by the local government, the housing typology and structure become formal and are brought under official housing regulation. Most houses have legal documents of ownership, while some houses that are located on the main street (only narrow alleys between buildings) have legal rights to occupy the land for a particular period (usually ten years). Hence in the First space position, the location is under the control of the government planning strategy, which includes rights to have clean water and sanitation access.

In the Second space position (Figs. 6 and 7), 'Kampung Kota' identifies the built form and the space character as 'smooth', 'kinetic' (Mehrotra 2010) and 'shapeless' (Hernandez and Kellett 2010). The three characteristics that define the built form and space are that they are not regulated by building codes; the shape/form follows the function, and there is no static performance or uniformity. The houses, public buildings and commercial buildings in this area have been developed following the needs of the users, or precisely the society in the social position. Figure 7 shows the

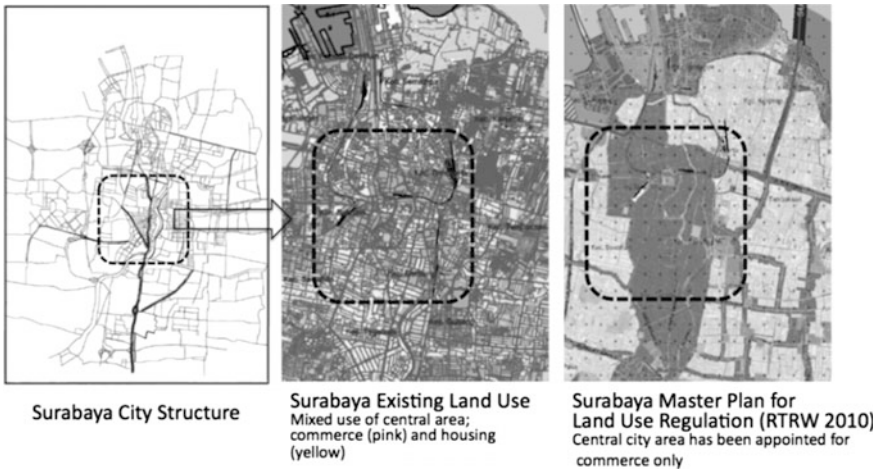

Fig. 6 Surabaya City Plan (*source* By Author, Interpretation of the RDTRK Tunjungan, 2008, Pemkot Surabaya, 2012)

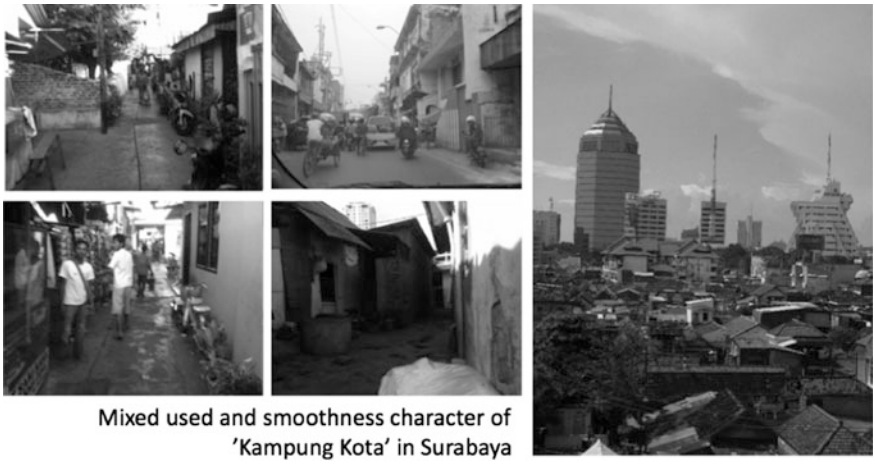

Fig. 7 Photographs of 'Kampung Kota' in Surabaya (*source* By Author (2012), documentation and http://www.journeymart.com/de/indonesia/surabaya.aspx, re-accessed 25 February 2016)

Second space of 'Kampung Kota' i.e. the smoothness and shapelessness are represented through its mixed use of space occupation and its physical performance of the buildings and narrow alleys.

Some of 'Kampung Kota' in Surabaya is far from slum or dirty conditions since the government in the 1970s started a program named the Kampung Improvement Programme (KIP). The programme provides clean water, sanitation and another resource (such as electricity and telecommunication) to the Kampung. Even though

the public works approach is not related to the economic and employment opportunities to the society (Harjoko 2009), it is evident the Kampung residents have the same rights and access to the primarily basic needs of any society in the city.

Lefebvre (1996) has differentiated two conditions relating to the process of industrialisation in its era about the focus on the product. They are money/commerce which refers to the products of the medieval/modern era (after the industrialisation), and works of arts which are the result of the Oriental/old era (before the industrialisation) (Lefebvre 1996). Recently in 'Kampung Kota' there has been a shift in the social conditions: from a society that was focused on the non-material, such as togetherness, kinship and family ties, to a society that puts money and commerce as it a central priority. For example, when some owners decide on house/space for rent (rooming houses) they consider the rental price based on the market price of the location (Pieters 2011). Before the industrialised era in Indonesia, personal and social relationships were the most important factor to be considered by its citizens. Another example is the houses along the main path, designated with a large privacy of security shown by high fences and closed gates. The presence of physical barriers of exclusion shows that the community bond is not giving a sense of security with an increasing need to of house owners to protect their properties (Pieters 2011) (Fig. 8).

'Cityness' is a word that expresses another reading of 'Kampung Kota' (Simone 2010). The term refers to 'the process' rather than to 'the product/city', which are social processes of the people and activity in the area. Lefebvre (1996) prefers to use 'in-habit' rather than 'habitat' to express the same meaning as Simone's 'cityness'. Reading 'Kampung Kota' regarding society and culture allows a focus on the people's process of creating the space/place to survive because of its marginality character (Colombijn and Cote 2011). The culture and the society in 'Kampung Kota' are similar to the condition in rural areas, where people have a strong sense of the natural environment and always give an interpretation of the context regarding their belief in a higher power (Padovan 1999). In this case study, the ties among inhabitants are strong, people in the neighbourhood know each other and like to share food and offer help to their neighbours. The social activity that occurs in the public space is very common, and everyone will give his/her private space freely social activity.

Fig. 8 Photographs of 'Kampung Kota' in Surabaya showing the real condition of security and privacy (*source* By Author, 2012)

Prospects and Threats of 'Kampung Kota'

To define prospects and threats of 'Kampung Kota' in Surabaya for the future, the current benefits and losses of the phenomenon should be investigated. The dialectic characteristics of the 'Kampung Kota' bring both advantages and losses to the society and the local government. The position of reading 'Kampung Kota' is crucial in defining the position of benefit or loss: in some cases it is beneficial for the society and a loss for the government, and it will be different from divergent views. This chapter contends the position of Lefebvre's and Soja's 'Triad Spatial Concept' is the best position from which to understand the meaning of 'Kampung Kota.

Historically, 'Kampung Kota' is a major factor in developing the city; it is an origin of the city. Further development of the city is more like 'star-shaped' development (only focused on the area around and along major streets). Therefore the location of 'Kampung Kota' is inserted in the middle of the high development area. For many years, 'Kampung Kota' is out of the government strategy but since the KIP programme in the 1970s; the area became cleaner and accessed by basic housing services. Furthermore, the current local government (the Mayor) is paying attention to empowering the society through activities which will increase the environmental quality (Fig. 9). Based on the city's history, 'Kampung Kota' has a significant position to be preserved and has a good prospect to be developed as a location of the city's identity.

Conversely, the capitalist economic power of the city let the more power of urban areas slowly evict out the less authority in the central city, or move out of the most expensive space of the city (Lim 2008). The inhabitants of some 'Kampung Kota' sooner become less and less of original people that experienced the social value of the area; it is changed to migrant people who more concern to the economic value of the area (Basundoro 2012b; Pieters 2011). The migrant population in some points less cares about the social meaning and ties among the inhabitants. Hence, a threat to 'Kampung Kota' regarding culture comes from inside the inhabitant, when they cannot preserve and maintain the unique value of 'Kampung Kota', which is culture and social role.

Fig. 9 Snapshot of Surabaya green and clean initiative (*source* http://rt4rw3.ketintang.blogspot.co.uk/, re-accessed on 25 February 2016)

For most low-income workers in Surabaya, 'Kampung Kota' is the most affordable area to live; cheap and close, while public transportation is limited and not readily available. Based on Basundoro's study in 2011, 'Kampung Kota' is the settlement for most informal sector proprietors in the city, such as street vendor, hawker, and seller in traditional market, and also serviced workers/labour of malls, offices, hotels, and other works/pleasures facilities in the central city. Moreover, based on Pieters's study, by 2009 most kampungs contained a new type in the form of rooming houses (rumah kost) since the mall boom in Surabaya. Hence, Kampung is an attractive location for most mall workers, especially young sales promotion girls. The informal economy in most Third World Cities contributes significantly to the city's economic life, gives benefit not only to the low-income people but also to the higher economic level. The strategic position of 'Kampung Kota' making the distribution of informal goods/service becomes efficient and covers almost all area of the city. In this point of view, the existence of 'Kampung Kota' is critical to support formal economics consumptions and services (Basundoro 2012b).

In the future, it depends upon the local government's position whether to preserve the 'Kampung Kota' or diminish it, or more precisely it depends on the urban designer and planner's approach. According to Harjoko (2009), the dual power of modernization and 'traditional' culture always in conflicts as long as a planner and urban designers in Indonesia preoccupation the urbanism learnt from Western ways of thinking. The Western modes of thinking put the 'Kampung Kota' in weak position inside the city setting, or out of the place (Simone 2010). Therefore, destruction of 'Kampung Kota', regarding the social role and physical existence, has frequently occurred in many cities in Indonesia. The urgency to consider 'Kampung Kota' in the planner and urban designer's view should be framed in the position of Lefebvre and Soja's Triad Spatial Concept: related to its social, history and society.

Conclusion

The best approach to understanding the existence of 'Kampung Kota' is through Lefebvre's and Soja's 'Triad Spatial Concept'. There are some reasons for this: first, the concept is connecting three dimensions of being and space; and second, the concept is free of a rigid division of views; while 'Kampung Kota' is the Eastern world urban phenomenon that has foundations in dynamic society and culture. It also refers to Indonesian society that has a tendency to feel and sense the environment (nature and built) in an abstract way, reflecting the social rather than physical symbol, mostly in the society that has a unique character of culture and social position (Padovan 1999). Another reason for Triad Spatial Concept application is that the term of 'Kampung Kota' reflects the condition of marginality resulting from the ambivalence/dialectic of urban development and world context. The Triad approach brings us to a conclusion that 'Kampung Kota' is in the position of Third Space in the urban setting.

The character of 'Kampung Kota' in Surabaya is reflected through observation of three different spatial functions: observation of everyday life (first space); study official plan of the area (second space); and exploration of the social symbol of the area to the inhabitant (third space). The case study is always in dialectic position: modern—traditional, urban—rural, and, unplanned—planned; whether regarding culture, social life or building types. The dialectic character brings both prospect and threats to 'Kampung Kota' itself. The way of seeing 'Kampung Kota' is crucial in defining the position of benefit or loss, the net benefit for society and net losses for the government, and vice versa. The role of the urban designer and planner is crucial to preserve 'Kampung Kota' have because the dialectic character is always in conflict as long as a planner and urban designers in Indonesia preoccupations learnt from Western ways. The urgency to consider 'Kampung Kota' in the planner and urban designer's view should be framed in the position of Lefebvre and Soja's triad spatial concept, to protect social meaning and identity.

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Dialectical Materialism and the Alternative Architecture of John F.C. Turner

Richard Bower

Abstract This chapter seeks to highlight and discuss Henri Lefebvre's spatial contextualization of Karl Marx and Friedrich Engels' methodology of dialectical materialism. The external and relational act of developing identity through mediation with context and content is discussed and pursued in light of its relevance to a contemporary globalised context and spatial practice. The translation of Lefebvre's discourse within contemporary architecture remains highly abstracted as the political implications are counter to the prevalent capitalist model of architecture in the Western world as a product and object. The spatial practices and subsequent discourse of John F.C. Turner are proposed as a detailed exploration of the same dialectic methodology. The practice of developmental architecture suggests a form of subaltern praxis, based on a spatial and materialist critique of social, political and economic context, and provide a concrete realisation of a counter-narrative to contemporary architectural practice and globalised abstract space.

Keywords Lefebvre · John F.C. Turner · Dialectical materialism · Praxis · Developmental

Introduction

Since its translation into English in 1991, Lefebvre's (1991) *The Production of Space* has come to be recognised as a prominent contribution to the discourse of socio-economic spatial theory and praxis. In architectural discourse, this key text is widely interpreted without due consideration to Lefebvre's specific theoretical lineage with Marxism and his earlier work that had for forty years been generating the conceptual framework needed to support such provocative observations of socially produced space.

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This chapter seeks to question Lefebvre's examination of dialectic methodology; its progression from Hegel to Marx, and how these processes evolved into Lefebvre's functional model of dialectical materialism that is so prevalent in contemporary spatial discourse. In pursuing this methodological lineage, this chapter re-contextualises Lefebvre's renowned observations of a spatial trialectic (perceived, conceived and lived) within his earlier observations of praxis as a descendent of Hegel's concept of sublation.

Marx's contextualization of material content is specialised by Lefebvre as a means to regain the concrete social possibilities of praxis. These ideas remain abstract and unrealised within Western architecture and spatial practice. As an alternative, the practice and subsequent discourse of John F.C. Turner are suggested as a concrete realisation of a specialised, material dialectic, and offer an alternative form of praxis to the contemporary Western model and a provocative relationship to Lefebvre's 'The (social) production of space'.

The Dialectic

Everything is transient and finite because it exists through interactions. Identity is created through relationships with context. Quantitative change inevitably leads to qualitative change. Change is helical, not circular (negation of the negation).

Fundamentally a dialectic is a method of formal logic, where a discussion between two or more points of view is undertaken to achieve a resolution through an open dialogue of reasoned arguments. However, the dialectic method generates a framework of interpretations that has a far broader series of philosophical and social implications. Of particular interest is how spatial discourse becomes implicated with the wider contextualization of social, political and economic theory and practice.

Hegelian Dialectics

The Hegelian dialectic method is understood as consisting of three distinct entities; a thesis (giving rise to reaction), the antithesis, which contradicts or negates the thesis, and the tension between the two being resolved using a synthesis. This methodology can be seen as both elementally simple and yet at the same time inherently complex, dynamic and provocative.

Fundamentally the method is predicated by the inherent flaw of the original thesis, thus requiring an antithesis. This issue is confounded by Hegel's use of alternative terminology in the form; Abstract-Negative-Concrete. For Hegel, it was the thesis being abstract and in isolation that necessitates its negative or negation and the subsequent process of mediation to cleanse it and return it to an abstraction. This suggests that nothing can remain outside of context. It must be tested,

challenged and eventually become something new through sublation, mediation, transcending. Ultimately, this resolution must always return as a purified abstract thesis. Lefebvre (1968: 17) writes:

> Reason itself must be defined by the movement of thought which challenges, unseats and dissolves particular assertions and limited contents, which passes from one to the other and tends to dominate them. Thus, the dialectic, the immediate relation between thought and its diverse, fluid content, is no longer outside logic. It is integrated with logic, which it transforms by transforming itself.

The strength of the dialectical method is found in this process of mediation; where an idea is tempered, evolved and transcended against a process of contextualization and negation. The importance of this concept for spatial theory is the suggestion that things—identity, meaning and value—can only be defined by their relation to each other. Mediation, the negation of the negation, allows for the fundamental thing to absorb and incorporate the other into itself (Hegel 1830). Hegel always maintained that the answer would always be an absolute and abstract form, much as great architecture is regularly understood as the perfect resolution of engagement with context.

Implications of Dialectic Methodology

The dialectic methodology has widespread and profound philosophical implications for questions of being, becoming and identity. Criticism of the inherent abstract negativity and externalisation of identity came to define much twentieth-century philosophical discourse. This began with Henri Bergson's time and free will and had recently become so prevalent in architecture due to Gilles Deleuze's alternative internal identity defined through the trajectory. This critique of the negativity and subjectivity of the anti-thesis is ultimately a rejection of Hegel's claim that contradictions and flaws are inherent and internal to things as an inevitability. However, for Lefebvre (1968: 28); "the question: 'which comes first, contradiction or identity?' has no real meaning. All movement is contradictory because without an immanent contradiction nothing can move. Movement is itself a contradiction, and the contradiction propels the movement".

Ultimately for Lefebvre, the significance of the dialectic is that it is transitional, which is a movement, suggesting a relationship to both time and space. The resultant synthesis is never defined as an answer, only as the next moment of the discussion and is inherently linked with a subsequent mediation-sublation, ad infinitum (Hegel 1830). This can be taken as either the damning realisation of a methodology without answers or conclusion, or as a provocation and a means to find value in the process itself. The power and value of the dialectic method are found in praxis; in the process of mediation, negation, sublation; and for Lefebvre, this means engagement with the spatial.

Dialectical Materialism and Marx

Marx and Engels' objections to prevailing Hegelianism are well documented and discussed. Their vehement attacks came from a collective outrage at what they perceived to be the politically, socially and economically abstract isolation in which Hegelian philosophy existed. Such abstract, bourgeois philosophy was inherently antagonistic to their political discourse on social deprivation and economic injustice. Hegel's derivation of a form of pure abstract philosophy was an "esoteric history of the abstract mind, alien to living men, whose elect is the philosopher and whose organ is philosophy' (author to provide a reference for quotation cited in Lefebvre 1968: 79). Lefebvre's treatise on the dialectic revels in the same sense of injustice at these structural abstractions and their persistence over a century later. Lefebvre (1968: 39) writes:

> Hegel was not content merely to deepen the content and make it explicit in order to attain the form, he reduced it to thought, by claiming to grasp it 'totally' and exhaust it. He insists on the rigorously and definitively determinate form, which the content acquires in Hegelianism. All the determinations must be linked together in order to become intelligible. As far as Hegel is concerned, these connections are not discovered gradually, obtained by an experimental method; they are fixed.

For Marx and Engels relationships were anything but clean and fixed, and their critique of Hegel's dialectic method came to define and give critical validity and purpose to their struggle to grasp content—historical, social, economic, human and practical. This pursuit of the substance of relationships ultimately formed the observational framework of historical materialism, leading to Marx's core theories of surplus value, surplus production and alienation.

It was not until Marx's (1859) *A Contribution to the Critique of Political Economy* and the beginning of *Das Kapital* (Marx 1867) that he began to look beyond the empiricism of internal connections and see the necessity of a methodological framework with which to observe and challenge his evolving discourse. Years after rejecting the dialectic, Marx was to re-discover a kernel of logic that could be salvaged from Hegel in what Lefebvre (1968: 72) described as "the only valid element in the whole of existing logic". What Marx famously proposed was to turn Hegel on his head. Lefebvre (1968: 72) summarises:

> The dialectic method, worked out first of all in an idealist form, as being the activity of the mind becoming conscious of the content and of the historical Becoming, and now worked out again, starting from economic determinations, loses its abstract, idealist form, but it does not pass away. On the contrary, it becomes more coherent by being united with a more elaborate materialism.

The dialectic was to become Marx's 'method of exposition'; a way of seeing and valuing content—with concrete reality at its 'inner movement' and not as just a 'juxtaposition or external organisation of the results of analysis' (author to provide a citation for quotations here cited in Lefebvre 1968:79). The content was the origin that determined dialectic thought. It was the thing to grasp, to critique and analyse in all the complexity of its development to discover its 'inner laws'. Contrary to

Hegel's abstract form, the dialectic was a methodological model with which Marx could observe and validate his theories of surplus value, production and alienation. This same insight provided Lefebvre with the necessary methodology to define a spatialised interpretation of power and authority that would later resound in his ideas of spatial representation.

> In a general way 'the concrete is concrete because it is the synthesis of several determinations, multiplicities made one. In thought it appears as the process of synthesis, as a result and not a starting point, although it is the true starting-point'. [Knowledge Process Outsourcing or KPO] … The concrete totality is thus the conceptual elaboration of the content grasped in perception and representation; it is not, as Hegel thought, the product of the concept begetting itself above perception and representation (Lefebvre 1968: 75).

Some 30 years before *The Social Production of Space* Lefebvre found, in the idea of a materialist dialectic, the embryonic framework of a methodology; an observational method that could transcend the official interpretations of Marx dialectics as 'laws of nature'. Lefebvre realised the significance of the political refusal to engage with concepts such as alienation and praxis were symptomatic of the ideology and political institutionalisation that had translated Marxism into a polemical abstraction. His response to this dislocation was to ground Marx's theories within space; to observe the tacit and explicit social production of space and define a model for their interpretation as forms of spatial representation.

While this somewhat whirlwind exploration of the dialectic may appear overtly abstract in itself, its significance to Lefebvrian discourse should not be underestimated. Lefebvre's resurrection of the potential inherent within Marxist dialectic materialism can be seen as the basis of his later incisive and critical observations and interpretations of spatial relationships. These spatial relationships could be observed within the methodology of a materialist dialectic and praxis, suggesting the concrete implications of a spatialised reinterpretation of the sociology of Marx; in the everyday revolution of space and life, not in theory and abstract space.

> The praxis is where dialectic materialism both starts and finishes. The word itself denotes, in philosophical terms, what common sense refers to as 'real life', that life which is at once more prosaic and more dramatic than that of the speculative intellect. Dialectical materialism's aim is nothing less than the rational expression of the Praxis, of the actual content of life – and correlatively, the transformation of the present Praxis into a social practice that is conscious, coherent and free (Lefebvre 1968: 100).

It is this idea of a conscious, coherent and free social practice that I now wish to discuss, and I suggest examples of concrete realisations of a dialectic materialism method as a subaltern model of spatial praxis.

John F.C. Turner and Development Spatial Practice

At first glance, Turner and Lefebvre are perhaps an unlikely pairing to discuss. Their works have each defined paradigmatic shifts in their respective fields; Lefebvre's social and spatial theory and Turner's developmental practice, yet are

connected by no apparent spatial, theoretical or historical relationships. However, a comparative analysis of their observations and interpretations of space suggests some provocative resonances. This chapter argues that Turner's development architecture can be interpreted as a form of spatialised dialectic materialism; interpreting, questioning and engaging with social and economic content to inform a spatially concrete response to a profound materialist context that exists within a model of praxis, not merely a physical architectural manifestation.

Between 1957 and 1965, Turner lived and worked in Peru for government housing agencies in the promotion and design of community action and self-help housing, and in particular in urban squatter settlements. Turner's experiences during this period provide the basis for a chapter entitled "The Reeducation of a professional" in the 1972 book *Freedom to Build*. Its premise forms the foundation for this comparative analysis. Turner writes (1972a, b: 123):

> It was only after living and working in Peru that I began to articulate the dissatisfaction shared with so many contemporaries. We felt and knew that architecture cannot be practiced as if it were an independent variable – as though the architect had no social or political responsibilities – yet neither could we accept the Marxist antithesis. It seemed as absurd to believe that social structure could be changed through architecture as it was to believe that architecture should be entirely subjected to the official interpretation of taste.

There is an inherent rejection by Turner not only of architectural modernism and its avant-garde abstractions from economic and political reality but equally a distrust of prevailing Marxist interpretations. It is a reasonable assertion that Turner was exposed to the same institutional Marxist orthodoxy that Lefebvre had encountered (causing his well-documented opposition to the French Marxist party, and so forth), but Lefebvre and other (notably György Lukács) re-articulations of dialectical materialism would not have been widely translated during Turner's education at the Architectural Association (AA) in London.

Studying at the AA in the early 1950s, Turner had been exposed to the discourse of CIAM and the works of Le Corbusier at the apex of the modernist architecture paradigm. Despite this educational context, it would be the transformative experience of Peru and the developing world that would define Turner's career, and provide the means to explore his sympathies with the anarchist theories of Peter Kropotkin and a long-held fascination with the systems theories of Patrick Geddes. Inspired by Geddes, Turner (1972a, b: 122) writes:

> Geddes' work caused me to doubt the value of professional schooling and, when I eventually escaped into the real world, his work also guided my deschooling and reeducation.

Inherent in Turner's experiences is a realisation of the implication of the real world; of raw unmitigated social, economic and political contexts. The dislocation of abstract modernist dogmatism in the Western world from the physical reality of third world urban squatter settlements could not be rationalised. Turner was faced with a concrete specialisation of content (and an early post-colonial perspective of uneven global development) that could not be transcended through abstraction, nor

resolved through economic market forces. His response can be seen as a form of both personal and methodological dialectic and a materialist critique of modernism and structuralist dogmatism.

Turner's Practice Experience

Turner's practical engagement with a developing world context led him to an interpretation of Western architecture as a representation and projection of power, authority and entitlement. As an alternative Turner sought the active engagement with a broader interpretation of context; of political, economical and human relationships, and the beginnings of a dialectical exploration of what Marx and Engels would understand as a materialist content, based on his reading of Geddes. According to Turner (1972a, b: 124), "Geddes method, clearly enough, was to involve himself as closely as he could with all the people concerned, especially with those who were suffering most from the consequences of urban dysfunctions and blight".

This re-assessment of the professional responsibility of an architect and personal liability of a citizen of the world, suggests the same materialist inversion that Marx achieved with Hegel's dialectic methodology. Faced with the reality and complexity of a visceral context, Turner rejected the conventional interpretation of the architect; the idea of a quantifiable architecture that can solve the problems of space, and placed content at the core of his interpretation of the developing world context. This explicit social imperative undoubtedly resonated with early architectural modernist sympathies for a utopian future, yet Turner's inversion defined the social success of these spatial practices not within abstract utopian ideologies, but in the practical reality of subaltern counter-narratives; architectural success defined by what it enabled people to do, not what it did for (or to) them.

Reeducation

In *The Reeducation of a Professional*, Turner (1972a, b) uses concrete examples from his experiences in Peru to illustrate how content invariably invalidates any fixed projection of ideologies onto it. These examples are not merely a discourse on architectural technologies, form or principles, but a discussion about postcolonial and subaltern narratives of a cultural, political and economic invalidation of Western representations of architecture and identity. Turner presents a critique of the fallacy that architecture is universal and that it can create and define community through the brilliance of the architect.

Turner's early experiences of government administered and hierarchically organised housing projects provide a dialectic exploration of the implications of the control and imposition of architecture, against the context, the concrete reality of

political administration of money, materials and resources. He was involved in various community housing projects using development models that relied upon the projection of an outside authority upon a community and the disconnection of people from their fate. Turner saw first hand the endemic failures and social damage these schemes caused.

These undoubtedly well-meaning proposals were designed by planners and architects who were never actively invested in the context and never experienced the long-term implications of short-term solutions. These projects equated to a generic modernist resolution of space, based on an understanding that the space of social-spatial relationships is static and disconnected, relying on the projection of abstract political and economic representations onto the illegal squatter communities in the barriados; and representations of space that had no relation to the social and political context of the communities. This abstract hierarchical model projected representations of space as quantitative and as a problem to be solved. Turner was able to transcend this modernist and structuralist paradigm.

Turner's Housing Development Alternative

The housing of communities using an administrative framework that determined people unable and untrustworthy to produce their space would be shown by Turner would be invalid. His experience led him to develop spatial practices that were both economically and socially revolutionary in the developing world and as this chapter suggests, remain a provocative realisation of a dialectic materialism that is a valid critique of contemporary Western Architecture and postcolonial globalised space.

Turner's alternative approach is not a utopian fantasy. Instead, it is perhaps the most economically valid and realistic approach to architecture that could be proposed. It is tempting to suggest that it was successful because it existed in primitive and illegal squatter settlements where spatial, economic and social standards are thought to be low. This would only reinforce the prescriptions of the same colonial spatial injustice and prejudice that Turner faced.

The architecture that he helped to generate was based on spatial practices that are as applicable to a Western context as they were to squatter settlements. They simply are an articulation of the interpretation of value; from a quantifiable system to a qualitative one. Moreover, this was not a reductionist schema based upon the phenomenological expressions of architectural aesthetic qualities of abstract Western economics; this was an interpretation of the quality of architecture based upon what it does for the individual and their community. This was architecture judged upon what it does socially and economically, not what it is aesthetical.

The implications of this spatial practice are profoundly linked to Lefebvre's conception of socially produced space and can be considered a concrete realisation of a Marxist material dialectic. What Turner proposes would reveal the architectural prescription of value judgements and aesthetic codifications, and in doing so dislodge the fallacy of architecture's authority through representation.

People did not need architects to design their houses for them in this context; to do so was manifestly arrogant, illogical and insulting. Instead, Turner was able to facilitate access to land for people who were squatting illegally. He fought for facilities and services to be brought into communities to help them work their way out through life. He developed spatial practices innately linked to subaltern narratives and was fighting against the spatial injustice of political and economic projections of abstract Western quantitative value structures.

These spatial practices, based upon a materialist dialectic dialogue with socio-economic content, were an expression of both a personal and methodological professional re-education, and a profound experience of the specificity and relationality of space. People and communities needed to remain in control over the entire activity of housing themselves if they were to hold onto and build a sense of self-worth, identity and community. Lefebvre's (1968: xxi) interpretation of dialectical materialism resounds in Turner's observations of the implications of these spatial relationships; "the rational expression of the Praxis, of the actual content of life—and correlatively, the transformation of the present Praxis into a social practice that is conscious, coherent and free".

In the face of these experiences, Turner defined a model of developmental architecture where the content came to be observed and interacted with not as merely physical space, but within the layers of political, social and economic fabrics that affected people's abilities to live their lives. The subsequent developmental work of Turner defined global policies for the rapidly expanding urban squatter settlements that have come to dominate urban contexts universally. These conditions exist to varying degrees within all urbanised cultures, and hence in practically every country in the world. This is not an isolated incident in developing countries who are outside our sphere of concern.

We live in a postcolonial world of uneven global development, yet much of our Western architecture remains an expression of abstract economic and social values that are devoid of concerns for spatial justice and responsibilities. In Turner's practices, I suggest we can derive a concrete example of a materialist and spatial interpretation of the social production of identity and space, and a model of praxis to engage with these issues dialectically.

Socially Oriented Praxis

If Marx can be said to have rescued the dialectic method from Hegel's abstract philosophy, then equally Lefebvre attempted to salvage from dialectical materialism the political imperative found in the notion of praxis. Indirect criticism of a prevailing institutionalised Marxism of abstract ideologies, Marx's writings had to be understood as a "programme or project [which] must be brought face to face with reality, that is with the praxis (social practice), a confrontation which introduces new elements and poses problems other than those of philosophy" (Lefebvre 1968: 7).

Marx and Engels presented the materialism of economics and humanism and used the dialectic methodology to understand their relationships to the political implications of the mode and relations of production and concepts of surplus value and alienation. This exposition of the human consequences of economics allowed the methodological observations and critique of the political context to connect with and transcend the empiricism of historical materialism, providing the alternative content for a dialectic model of praxis. Lefebvre (1968: 82) writes; "[T]o get to know economic phenomena is, on the contrary, to study their objective and substantial process, while at the same time destroying and denying this absolute substantiality by determining it as a manifestation of man's practical activity, seen as a whole (praxis)".

Marx's sociological alternative has ever been confounded by the now seemingly inevitable institutionalisation of his observations and critique within the narrow reductionist perspective of anti-capitalist sentiments. The sterility and structural identity with which Marx came to be interpreted was at the heart of Lefebvre's connection with material dialectics. Inherent in this methodology was the idea of praxis and change; and the effect of this change within space. According to Lefebvre (1968: 93):

> The third term [the sublation/mediation/synthesis] is, therefore, the practical solution to the problems posed by life, to the conflicts and contradictions to which the praxis gives birth and which are experienced practically. The transcending is located within the movement of action, not in the pure time-scale of the philosophical mind.

Some 30 years before *The Social Production of Space*, Lefebvre saw within Marx's critique of abstract Hegelianism, the significance of space i.e. its conflicting forms of both representation as a means of the projection of authority, and as the only medium in which the praxis proposed by Marx could exist. Dialectic materialism was the methodological framework, but a spatialised praxis was the alternative that had to be realised. Lefebvre (1968: 124) continues:

> The activity of production is wary of contradictions or objective conflicts between forces, because they may lead to the disruption of the desired consolidation […]. In this way activity strives to consolidate the contradiction itself, to make it into an instrument and a determinism. Such an operation is feasible; it may succeed. But it is itself only relative and only true for an isolated object. It does not abolish either the dialectic of nature or that of activity.

At this time, Lefebvre is still describing the force of praxis using the language of 'movement' and 'conflict' or 'contradiction', relying on the dialectic model to validate and reconstitute the work of Marx. However, within that idea of movement exists a tacit implication with spatial practices; with the notion of a continuum of space and time provoking change through the dialectic. The same observations appear within Turner's interpretation of Geddes diagrams of cause and effect. The transition from an interpretation of space as hierarchical and cyclical to that of a continuum of relationships are marked throughout Geddes' discourse. A methodology that implicates individual and social action with economic and

institutional change resound within Turner's experiences and spatial practices. For Turner (1976: p. 103):

> Practical activity and effective action is what we and existence are all about. As well as being stimulated by them, actions lead to problems. And problems raise issues. Issues, in turn, indicate principles for action, while principles determine the resolution of issues. And finally, principles are guides for practice as well as being generated by it. These elements in the development of a process for action must be fully recognised for any coherent discussion of social, institutional and environmental change.

Turner understood that without placing these ideas within a broader spatial context, they remain as isolated entities. Only through their interrogation in the spatial and the observation of their forms of representation and authority do their implications become manifest. The dialectic model relies on contradiction, but it does not prescribe resolution. The concept of action cannot be restrained within a structural model. It must exist within a continuum that is both temporal and spatial. Lefebvre (1968: 125) explains: "This is a sophism that can be avoided by passing on from consideration of the isolated product to consideration of the sum of products, from consideration of the partial activity to the movement of the total activity. Activity does not abolish contradiction; it lives on it".

Lefebvre and Turner

There is an apparent dislocation between the work of Lefebvre and Turner, yet by comparing their respective work as interpretations of a material dialectic dialogue, distinct similarities become apparent. The premise of this chapter was to identify the inception of Lefebvre's discourse on space with his interpretations of Marx's dialectical materialism. This allows Lefebvre's spatial observations to be understood as a rejection of the abstract over the concrete. Marx's rejection of Hegel's philosophical abstract form and subsequent engagement with the content of space—be it social, economic or political—is at the core of all Lefebvre's spatial theory.

This chapter's inherent critique of architecture as abstract form and aesthetics suggests that by understanding Lefebvre's spatial theory as a materialist dialectic methodology, architecture must be understood as spatial practice implicated with the social praxis and the production of space. It is imperative that this be understood as the core strength of Lefebvre's spatial discourse as it suggests architecture not as a form, but as a vehicle to produce a praxis. The immediate value of praxis is the key link to space as a medium for actions to be explored, critiqued and evolved.

Lefebvre's spatialization of the dialectic methodology is a critique of the inherent antagonistic dichotomy within the dialectic method, rendering social and political space without its innate dynamic potential. The critique of space as a trialectic provides an inherent tension and instability that achieves the helical change of a dialectic but within a framework of social implications. Two opposites can no longer stand doggedly in opposition, but instead always retain the potential

for action. In contextualising the materialist dialectic methodology within space Lefebvre realised he would create a continual qualitative imbalance that could be observed, critiqued and transcended through praxis.

As a form of spatial agency within the representations of space, Western architecture is intimately implicated with the political and social observations of Lefebvre's critique, yet remains seemingly unable or unwilling to separate its praxis from the formal aesthetics; with the master builder identity as the "fixer" of space. The history of architecture is littered with examples of architecture solidifying spatial inequalities within formal aesthetics. An alternative history of architecture does exist.

The brief comparative analysis of progressive development spatial practice and the work of John F.C. Turner presented here place a new significance on his work as part of an alternative history of architecture that continues to be overlooked. Having gained considerable popularity in the 1970s, Turner's work has since been overshadowed in the Western world as we retreated to inward looking self-referential dialogues. When compared to Lefebvre's spatialised dialectical materialism, Turner's practices offer a socially and economically sustainable model for a Marxist and Lefebvrian interpretation of space, which in the contemporary climate deserves further consideration.

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Part V
Praxis and Built Environment

Good Places Through Community-Led Design

Vera Hale

> *Good places are never bought off the shelf, but arise in an inclusive process built on local ideas, imagination and aspiration* (00:/ 2011).

Abstract By making the community a genuine part of the design process, we can create a more sustainable urban future. This can be achieved through a community agency, as urban structures exist by the virtue of rituals and interaction. However, as communities become more transient with fewer geographical boundaries, society's impetus to act collectively has become weakened by a diluted community spirit, reducing its 'social capital'. This chapter seeks to identify renewed praxes of sustainable community participation in the realm of urban developments. By evaluating the importance of community involvement and exploring past and present modes of interaction between built environment projects and its neighbourhood, we can establish the levels of participation and empowerment that are required to enable 'Good Places'. It will also investigate how to generate a more inclusive and representative process of urban regeneration, by examining how 'social capital', the collective memory or a sense of place, can be regenerated and captured to assist in developing systems for participatory action. This will allow the creation of more sustainable spaces and places for an increasingly fluid contemporary society.

Keywords Community-led design · Community engagement · Community involvement · Participatory design · Social capital

Introduction

The Glass-House is a London-based charity that champions community -led design. Through workshops, events and tailored services they help community groups and professionals gain skills to understand the design process better, involving and benefiting local people. The Glass-House began in 1999 when The Glass-House Trust commissioned an action research project in collaboration with The

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Architecture Foundation and the National Communities Resource Centre (NCRC). The aim of the project was to explore what effect the built environment has on our quality of life and to help community groups have a more active role in decisions about their local environment. This led to The Glass-House becoming a national charity in April 2006. Since then, they have continued to work with community groups and professionals to make a positive difference to the spaces they live in (Anon 2012).

In June 2011 The Glass-House successfully secured an Arts and Humanities Research Council (AHRC) funded Collaborative Doctoral Award, with the main topic of the research being community led design. The Ph.D. at the University of Sheffield is to investigate the practices and community involved projects of The Glass-House since their inception in 2001 to establish value and benefits of community-led design, not just for the community but also for the professional stakeholders, in particular, designers.

Community-Led Design: What Is It and Does It Work?

For the last few years, The Glass-House has organised debates around the country to discuss topics concerning community participation. Moreover, in light of the Doctoral Award, for their 2011–2012 debates series the theme was: 'Community-led design? What is it and does it work?' As the term 'Community Led Design' can have a different meaning to different people, the debate set out to see what it meant in practice. Does it lead to high-quality places and spaces that are more sustainable on all levels; socially, economically and environmentally?

They asked panellists from different backgrounds to give their experiences and views on community led design. Each speaker had 10 min to present their work followed by questions and or discussions with the audience. The four debates were held in Glasgow, Bristol, Newcastle and London (Fig. 1).[1] At every debate, there were four speakers; a design professional, a local authority worker, a developer and a community member or representative. Each discussed the merits and barriers he or she encountered within community participation.

What became clear during these inspiring debates was that it was difficult to pin down what community led design meant. None of the speakers formulated a definition for community-led design and as such the questions were never fully answered. The debate in Bristol touched mostly on the question. In the other discussions, the human aspect was less significant from what was presented. Even though most of the speakers talked about the communities they worked and collaborated with, there seemed little actual reflection on the community's involvement. In contrast, all the Bristol speakers discussed the process with the community

[1]I was able to go to three of the debates. I was unable to attend the Newcastle debate, therefore in my reflections I will only use my experience of the Glasgow, Bristol and London events.

Fig. 1 *Photographs* of The Glass-House Debate series. From the *left* Bristol debate and London debate (*source* Vera Hale, 2011–2012)

and how this was key to community engagement. According to those speakers, it is all about collaborating as equals. As Oona Goldsworthy, chief executive of the Bristol Community Housing Federation phrased it: "It is not 'other', it is us". Designers should not impose or placate their thoughts and designs onto the end user, but by working together generate a sustainable collaborative design solution.

A lot of the speakers were unable to address the debate title. This lack of opportunity could have been due to the setting of the event where the speakers had only a limited amount of time to deliberate on their experiences and positions on the matter of community participation. However, it is also indicative of the difficulty of defining community engagement and in particular the term 'Community-Led Design'. This chapter will highlight some of the challenges that come with community involvement, using the themes that rose from the debate series and will also discuss some of the ways to investigate 'Community-Led Design: What is it and does it work?'

Themes of Participation

The series created much food for thought. It was surprising that each speaker had something new or different to convey, and all had a unique point of view. It showed how far-reaching community involvement is within the built environment and most of the speakers agreed that it was essential to creating good design. Also fascinating was that most of the underlying themes traversed the professional boundaries. The overriding theme in Bristol was that of the process of participation. In London there was a focus on increasing involvement, moving beyond consultation fatigue to positive engagement. At Glasgow's debate, there were some honest reflections on the barriers to the participation in which funding, time, apathy and process being the

most prominent. Moreover, Newcastle showcased the social benefits of participation.

Most of the themes addressed in the debate series are not new to the realm of community engagement. Due to the complex nature of both communities and democracy, many factors contribute to the process of participation. On the whole two queries that stood out throughout all The Glass-House debates were; 'How to get local people more involved?' Moreover, 'What type of tools and skills need to exist for communities to be an equal partner at the design table?'

Inspire to Aspire

Aspiration was one of the key themes that came up in the debates. It is easy to think that most people and communities will have individual and collective aspirations to better their lives and to increase their opportunities. So why does not everybody get involved in participation projects? Why do they not take control over what is happening around them? One of the reasons is that people are mostly unaware what impact a development will have on their environment and actual lives (MacLaran et al. 2007). Due to over-consultation and lack of trust with local authorities, communities do not believe their opinions are valued. Mostly they lack the skills to express themselves sufficiently when they do engage with consultation. To be an equal stakeholder within the design team, they need to have confidence that they are a respected member in the design process. To overcome local apathy, demoralisation and alienation are key in getting a more inclusive and representative participatory process (ibid., 2007). It is part of the professional's role to inspire the community to aspire and help them build this confidence.

Empowerment

Throughout the debate series, the theme that was mentioned most frequently was the empowerment of the community. Being part of the consultation process seems to generate individual and collective empowerment. Giving people a renewed confidence in their ability to achieve, which, due to circumstance, they may never have had the chance to do before. For some, this outcome is just as important as the actual result of a building or neighbourhood development. To give a community self-esteem and an increased sense of well-being is a valid reason for participation, as it leads to people being more engaged and willing to co-operate in their surroundings (Grillo et al. 2010).

However, how can we support people gaining confidence in their ability before the consultation starts? That is, how can we help communities to aspire and to feel empowered to make a difference, be heard and get involved in the decision-making process early on. What is empowerment in the grass roots movement and other

bottom-up participatory action approach? A sense of urgency brings people together to oppose a development and feel engaged to take collective action to protect their locality. But not all projects start from such an antagonistic premise. How do we get people to become more aware of their democratic right to be part of civic engagement (Dewey 1954)? It was evident during the debates that the communities need to be involved from the start to increase the success of the design and that their expectations are paramount to the success of community-led design praxis.

Expectation

It is important that aspirations be developed early on, through extensive brief design and vision making (Blyth and Worthington 2010). However, with aspiration comes expectation, another issue that was addressed during the debates. During the design process, communication is key to managing expectations and avoiding disappointment later on in the development. The design process is a long fluid one, with many factors that can change over its course. Funding, time and policy are some of the elements that change the brief and design throughout its development. As professionals we know it is part of the course of projects, but when aspirations have been raised and when the final project is not in line with those expectations of the community stakeholders it can create alienation and disappointment. By communicating changes and addressing aspirations versus requirements, a collaborative approach can create a design that everybody can enjoy. Moreover, if occupiers are happy, at ease and comfortable with the building, they are more likely to look after a place (Treib 2009b), which increases the sustainability of a building or space.

Architecture and urban design have an enormous impact on the quality of life and can undermine the very viability of the community itself. However, as communities are complex not everybody's needs can be met. Interventions can solve problems for some while being a burden on others (MacLaran et al. 2007; Pallasmaa 2009).

Value of Participation

Nowadays community involvement is not only seen as desirable; it has become an essential part of project development and a moral right (Robinson et al. 2005). It has become fashionable, with even politics subscribing to it with the Big Society, Localism Act and Neighbourhood Plan as a self-help approach to moving away from the welfare provision and giving people and communities the means to help themselves (Williams and Windebank 2001). However, where is the funding for this self-help strategy? People are left to their own devices to delve into the world of planning which is hard for professionals at the best of times. Funding is required to develop skills and tools for the community to be a valued stakeholder and budget

needs to be available for additional time to properly engage with the community at the higher levels of American director of Community Development Sherry Arnstein's ladder of participation. This allows moving forward from the usual informing, consulting and placating forms of participation in most present day events, towards genuine partnerships and even citizen control (Arnstein 1969).

However, these extra funded resources add more risk from a developer's perspective. Why should they pay and invest into this when their interest lies in high short-term gain? Moreover, what is the value of participation for the professional stakeholder? What do all the extra money, time and complications add to their role? Interestingly enough, according to one speaker, Section 106 funds were the largest source of funding for these resources. Section 106 is the UK planning policy that makes large-scale developments fund community projects in the areas that they are going to build in. It was more forthcoming than actual government spending on engagement, according to the speaker.

Social Capital

What stood out most in the debates was that the community was seen as the biggest resource. It was evident that an active community would lead to a more engaged design process. Other case studies also show how community involvement and governance create social cohesion and economic stability in the local areas (Evans 2002) and lead to greater civic engagement (Grillo et al. 2010). Argued here is the need to find out how to best utilise this resource, the people themselves, and for the people to become aware of their worth, because if people do not realise this, they cannot act.

However, what defines a community? Bell and Newby (1976) describe three concepts of community-based on topography, local social systems and human associations (Urry 1995). Whereas in the past people were more part of the first two principles of community, neighbourhood and or religion, modern communities are now more bound by interest and less by geographical or social constraints. This makes communities more transient, that, and neighbourhoods being (re-)developed at a constant faster pace. This creates new obstacles within community projects, i.e. a decreasing sense of collectivity. To have a community-led design we need to have communities that have a capacity and willingness to act together. Shared longevity of residence and common cultural ties are associated with the ability of a community to act collaboratively. It is the community's 'social capital' (Evans 2002). So have these changes to society and development affected its 'social capital' to act as one? Has it changed people's sense of community responsibility (00:/ 2011; NESTA and CABE 2011)? Alternatively, are there new ways of generating agency in an increasingly fluid contemporary society to create great community places?

Good Places

Most of the speakers agreed that community involvement leads to the right designs and spaces. However, what defines a good design or space? How can we evaluate the participation process if we do not know what the aim or outcomes should be? This research examines these questions and seeks to establish a framework by which the participation process can be measured. As 00:/ describe it "good places are never bought off the shelf, but arise in an inclusive process built on local ideas, imagination and aspiration" (ibid., 2011). Good places are thus developed through community and professional cooperation that increases the identity of the people as well as that of their surroundings. With this sense of empowerment, more sustainable spaces are potentially created.

Michael C. Grillo et al. describes social capital as the possibility to act collectively or individually through a network of relationships based on trust, reciprocity and values (Grillo et al. 2010). This will, in turn, lead to urban sustainability, as urban structures exist by the grace of urban rituals and interaction (Sennett 1992). Through sharing certain experiences, groups can establish a sense of togetherness (Pallasmaa 2009). Through incorporating elements of these common experiences, places can help in developing shared principles which bind our collective identity together (Dovey 1999; Lyndon 2009).

Through community activation, we can achieve liveable spaces that are structured to attract and hold memories (Lyndon 2009), creating individual and collective identities (Treib 2009a). The ease, comfort and content that some places have are based on past experiences and emotions that help form our sense of space and what we associate with it. Places need to establish their social memory that can accommodate the changes of time and people but maintain its collectivity (Fig. 2).

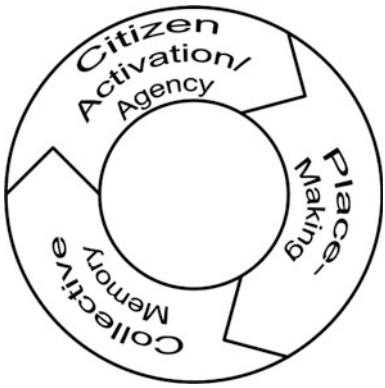

Fig. 2 Collective memory, Citizen Activation & Agency, Placemaking (*source* Vera Hale ©The Cave Co-operative)

Future of Community-Led Design

In the debate is was clear that to create good places through community-led design a culture shift for both the community and the professionals is required. The community needs to become a more active citizen willing to take control of their surroundings and events happening around them. Through social capital, they can develop a stronger sense of self and voice their collective opinion. They need to establish as broad a network as possible of their community so that there is inclusive and representative participation. It is easy to overlook how diverse and complex communities are, even for those living in the neighbourhood.

Reactivating citizenship does not always happen on its own. The community will require assistance from professionals to increase their sense of agency. Designers, planners and developers have to take on new roles and find new ways of working, for instance, a more collaborative and multi-disciplinary way of doing things, with consideration for the end user of a project. With this comes new responsibilities to obtain a representative, participatory process. It will be impossible to get 100% involvement for any project, but the profession needs to make sure that the process is as inclusive as possible. During the debates, this role was mostly attributed to that of the planners who then became more facilitators and mediators (MacLaran et al. 2007) of the whole process, having an overview of the bigger picture.

Most present day participation falls under the consultation and placating part of Arnstein's ladder of involvement. The ladder represents levels of public participation in public decision-making. Placation and consultation are where the community is allowed to share their opinion and advice on the design and brief, but the professionals still make final decisions. Placation and consultation are therefore still a form of tokenism. Arnstein acknowledges that the ladder of participation is a simplification of the gradients of community engagement (Arnstein 1969). However, should it be about levels of involvement? Should it not be about processes of collaboration, as each stage requires a different approach to get the right representation, information and engagement?

The role of the professionals is still central to the whole participation process because of their in-depth knowledge of bureaucracy, legislation, design and development (Sandercock 1999). As for designers, the scope of the work needs to change. Part of the new role would be to guide the community through the design processes and help them understand each step of the way. This requires the professionals and also the community to become fluent in a range of aspects, such as understanding the community through communicating, listening, and interpreting (Sandercock 2000); and to get a holistic overview of aspirations, needs and requirements. Another role for the practitioners is to think beyond the community at hand, making the designs future proof for the next generation to occupy. Thus creating sustainable places that can accommodate a more transient society.

At present, there are gaps in the training of planners and designers. They are trained to own the decision they make but lack essential skills such as facilitating

and mediating (MacLaran et al. 2007). In our desire to create, it is hard to leave room for change and opinions of others, especially if those people have no voice and if they do, have not got the expertise to articulate their ideas. It is easy to take control and make decisions on behalf of the neighbourhood, but we need to accept the community as an equal stakeholder. From a point of mutual respect a community can feel that they can represent themselves and feel that their opinions are valued. As the architectural theoretician Jane Rendell describes, practitioners need to choose to relinquish control over the final project and hand the decision-making process over to others. This marks the start of "a different creative consciousness, which in turn asks for new critical engagement: not a holding down but a letting go" (Rendell 2006: Author to provide page number).

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Strategies for Modern Schemes for the Inner Ring Road of Sheffield

Like Jiang

Abstract The Inner Ring Road of Sheffield was first proposed in the 1930s and mainly constructed in late 20th century. While trying to serve effectively as traffic arteries, the ring road, which has required massive demolition, is somewhat physically arbitrary, appearing like a huge scar on the existing urban fabric. This chapter investigates the Inner Ring Road schemes in the early-mid 20th century, to explore how the project had originally been envisaged and decisions were made, as well as the impact it imposed and the indication it revealed. It seems modern schemes in that period were very largely based on engineering thought, and the social ideas in the meantime encouraged a centrally controlled approach and a highly ordered and developed urban vision. While the outcome of the road had been improved due to much broader concerns over the following decades, many original ideas and features in the schemes in the early-mid 20th century are retained, and continue to affect the current city. As highway construction will still be needed as cities keep developing, it is important to have a thorough understanding of how the early schemes were conceived and worked out in a time when motor traffic emerged as a dominant type of movement in urban areas.

Keywords Ring road · Early-mid 20th century · Social ideas · Engineering approach

Introduction

With the rapid development of motor traffic in the early 20th century, planning for roads to facilitate the new type of movement became an increasingly essential part of town planning. Many new concepts of the city emerged, featured with a framework based on the application of a creatively and deliberately structured new road system.

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Fig. 1 Urban fabric of Sheffield (*source* Sheffield City Centre Master Plan 2008)

The idea of the ring road, having appeared in the 19th century, became widely accepted and developed during this period, and can be found in many post-war city development plans in the UK (Lewis 2006). Among them, is the Inner Ring Road of Sheffield. First proposed in the 1930s and built from the 1960s onwards, the road encircles the city centre and connects some major motorways running towards it, helping the city to keep up with the growing volume of motor traffic, and leaving on the ground an enormous manmade circle which represents order and efficiency (Fig. 1).

Being regarded as a key component in solving problems of the modern city and society (Corbusier 1933), transport planning was a reflection of the contemporary urban and social thoughts. This chapter will study the schemes of the Inner Ring Road of Sheffield in the early-mid 20th century, to discuss the deep intentions and values behind them, and their relationship with the social ideas at that time.

Background of the Road System in Sheffield Before the Mid-20th Century

The settlement in the northeast of the present day city centre has become the commercial and social centre of Sheffield since as early as the 13th century (South Yorkshire Historic Environment Characterisation 2012a). It can be learned from

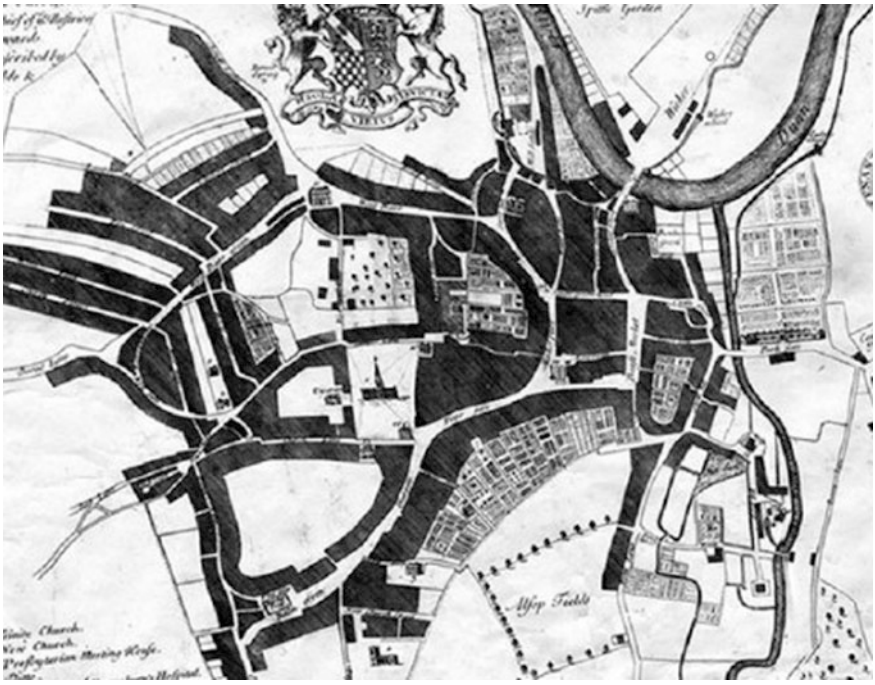

Fig. 2 Ralph Gosling's map of Sheffield 1736 (*source* http://sytimescapes.org.uk/zones/sheffield/S10, re-accessed on 25 February 2016)

Ralph Gosling's plan of Sheffield in 1736 (Fig. 2) that an irregular road network, well envisaged to fit the difficult topography, had been developed and retained during the early period of the urban growth.

Then from the late 18th century to the mid 19th century, to cope with the rapid development of industry in the city, a street pattern known as the "industrial grid", which formed a hierarchy and facilitated land use and business distribution, was laid out at the south-west of the then city centre. The 'industrial grid' joined with the irregular grid-shaped during the earlier time and together make an underlying structure of the road system today (South Yorkshire Historic Environment Characterisation 2012b) (Fig. 3).

With the proliferation of motor vehicles in the 1930s, traffic congestion and chaos had arisen as a serious issue in the city centre of Sheffield. Apart from the general growth of traffic volume, the inefficient road distribution with unmatched land use, which was to a large extent a result of the restricting topography and unsystematic development, contributed gravely to the problem (Sheffield Town Planning Committee 1945). It was urgent that a new road system be devised to serve the emerging development of modern traffic.

Fig. 3 Urban fabric of Sheffield in 1945 (*source* Sheffield Replanned: 11)

A New Pattern of Road Network: The Inner Ring Road Scheme in 1939

Early in 1924, an inner circle in the road network was envisaged in the Sheffield Civic Survey and Development Plan in the Report by Patrick Abercrombie on the scheme prepared for the Development Committee in collaboration with R.H. Mattocks to provide first name, Abercrombie. However, this circle sited approximately 0.3 mile East of the Inner Ring Road today, was aimed to make connections to roads coming from the north and south-east (Abercrombie 1924) and presumably offer access to places of civic importance in the city centre. It was not until 1938 that a scheme which underpinned the Inner Ring Road today was proposed in the first draft of Craven's Scheme for Central Area (Lewis 2006). The next Draft Sheffield Central Scheme in 1939 (Fig. 4) retained much of the features of the Inner Ring Road. Those features include a six-lane width, covering present day Netherthorpe Road, Upper Hanover Street, St. Mary's Road, Suffolk Road, Sheaf Street, Castlegate, Bridge Street, West Bar, Moorfields and Shalesmoor, and designed to exclude through-traffic from the city centre (ibid.).

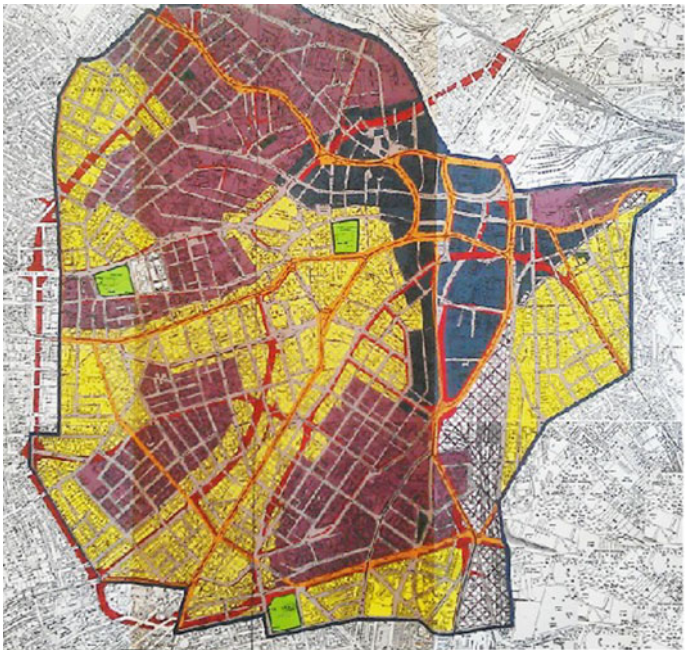

Fig. 4 Draft Sheffield (Central) Scheme 1939 (*source* A history of Sheffield's central area planning schemes, 1936–1952: 48)

Before Craven's schemes, Hadfield, "an expert in highway maintenance", had been preparing a planning scheme (Fig. 5) for the central area. To a large extent Hadfield's proposal superficially worked out the basic physical structure of Craven's road system on the map (Lewis 2006). However, this road scheme was simply made up by a piecemeal intervention and revealed a lack of comprehensive re-thinking (ibid.), and there was no emphasis on forming a ring road. By contrast, Craven's schemes, conceived via a systematic approach, showed a strong hierarchy of the road network. This sense was also much bolder than in Abercrombie's scheme. In fact, Abercrombie's road scheme, though it established a system linking up the urban area with a focus on the "enhancement of civic dignity" (Abercrombie 1924), was not configured with a clear structure. Even the inner circle it delineated from was mere "a sort of inner ring of some utility which "can be described with the help of one or two short links" (ibid.). It was more like a group of improved roads which could be traced to form a circle, rather than a purposely designed class of road, as was the Inner Ring Road in the 1939 scheme, with the specific layout to serve dedicated functions.

However, planning, which showed order or hierarchy, had been developed and existed since a much earlier time. Physical forms of the city or its component

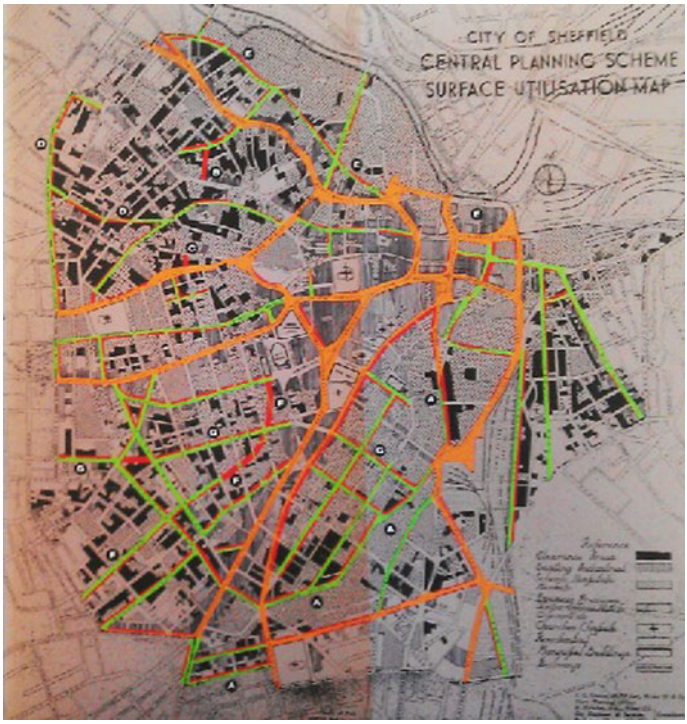

Fig. 5 Hadfield's plan 1935 (*source* A history of Sheffield's central area planning schemes, 1936–1952: 33)

achieved by comprehensive and systematic planning from ancient time to present day can in many cases be seen as a reflection of contemporary social conditions and ideas, for which they are deliberately drawn. The industrial grids in Sheffield carried out during the industrial flourish is a relevant example; and a century later, the new road network featuring an inner ring road can then be tagged as a greeting to the coming dominance of the motor vehicle in urban traffic. However, progressively, the initial motivation of planning in the early 20th century was much more than just physical remodelling. It was conceived to be a form of social engineering through which to ultimately reform the society by reshaping and reorganising the built environment (Mumford 2000). It is not evident, though under a context of this kind, that the 1939 scheme conveyed such an ambitious concern, but it is realised that though drawn up before the war, the scheme revealed a sense of "reconstruction plan" (Larkham 2001). It is clear that the Inner Ring Road aimed to deliver reasonable and powerful control over traffic movement in the city and foster a new order of civic lives, with the way and process used to carry out this large-scale project itself becoming another social practice.

The Inner Ring Road Scheme of 1945

The air raids in 1940 were undoubtedly a grievous calamity in Sheffield's history. They did, however, offer the positive opportunity for "new proposals of a more comprehensive nature, particularly in the Central Area of the City" (Sheffield Town Planning Committee 1945), which led to the Sheffield Replanned in 1945

While retaining the same zoning proposal like that in 1939 plan, the 1945 scheme came up with a new structure for the road network in the Central Area (Fig. 6). Apart from the slightly adjusted Inner Ring Road, another ring, the Civic Circle, was proposed to encircle the immediate core of the city centre to divert "unnecessary traffic" from it (Sheffield Town Planning Committee 1945). That is, to facilitate traffic with origin or destination inside the common core to move around it to find the right entering or leaving point and thus to avoid unnecessary traversing to afford convenient access (Minister of War Transport 1946). So with the provision of the Civic Circle, the Inner Ring Road, still kept to ease traffic movement from one side of the city centre to another, can function for its specific purpose more exclusively and efficiently.

The more sophisticated system of the road network in the 1945 scheme showed progress in laying out a city, which responded to and promoted the proliferation of motor traffic. The system of concentric circles connecting radial roads had long

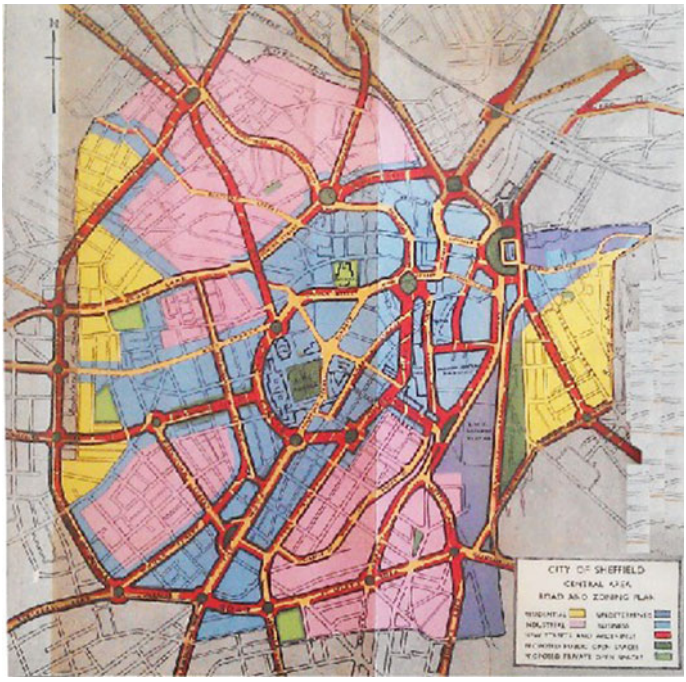

Fig. 6 Central area road and zoning plan 1945 (*source* Sheffield Replanned: 30)

been favoured and planned by many of the great cities since urban traffic became a serious issue, in some cases at enormous cost to lay it out across the existing road network (Lewis and Lewis 1949). Along with and emulating many other great and progressive cities in the UK, Sheffield made this "wheel and spoke" pattern of layout a stereotype of road system applied in post-war rebuilding (Lewis 2006).

Location and Design of the Inner Ring Road: Route and Urban Boundary

While no explicit boundary was delimited for the Central Area in 1924's plan (Abercrombie), it was clearly defined in the 1939 scheme (Fig. 4), and so in many of those from then on to the present (Koetter, Kim & Associates 2000; Sheffield Town Planning Committee 1945; Sheffield City Council 1988, 1993). In 1960, it was noted that northern industrial cities of Britain were quite in common suffering from "a ring of urban blight" between the city centre and suburbs, which provided the ideal location for the construction of an inner ring road (Power 2007). While it is hard to tell whether it was an "urban blight" or not, a potential ring, which divided the business and worked areas from the residential surroundings, did exist

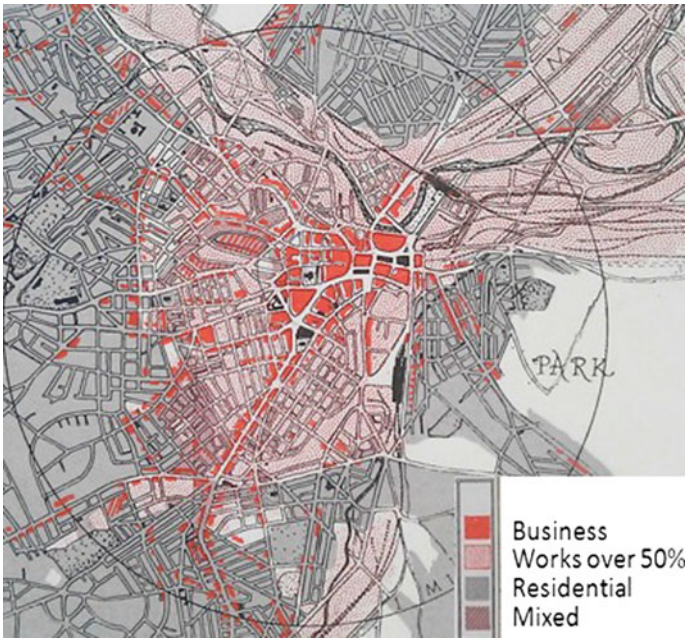

Fig. 7 Map surveyed in 1924 (*source* Sheffield Civic Survey)

on the 1924 map (Fig. 7), and the later Inner Ring Road should have to be laid out more or less in accordance with it.

While it roughly coincided with the proposed Inner Ring Road, only a tiny part of the boundary in the 1939 scheme shared the same location. The most sensitive areas were along the north and east lengths of the line, where the boundary expanded far across the Inner Ring Road. It could be understood that the north part of the border had referred to the River Don, but it was unconvincing to exclude the Wicker/Riverside at the northeast end of the Central Area, for it had always been an important part of the city centre over Sheffield's history.

The Inner Ring Road was gradually playing an increasingly important role in defining the Central Area, at least on paper. In some plans in late 20th century, when the south-west half of the Inner Ring Road had been completed, the boundary of the Central Area coincided exactly with the closed road. While future construction for the north part of the Inner Ring Road was still quite uncertain by 1980s, the north boundary of the Central Area in 1988 plan was the Railway (Sheffield City Council 1988). However, in 2000, preparing work for the north part of the road was in process, and the north boundary of the Central Area in the regeneration plan was altered to lie totally on the road (Koetter, Kim & Associates 2000). It was pointed out that the new-built road carried the purpose of penning in some marginal areas to integrate them into the Central Area (Sheffield City Council 2012), conversely excluding other areas.

However, in the mid 20th century, planners and engineers were not so aware of the vast power of the Inner Ring Road in plotting out the Central Area. Debates over alternative routes of the proposed road network were mainly about traffic efficiency (Lewis 2006). Vast areas which should have been tightly connected with the city centre e.g. Park District (Abercrombie 1924) were unconsciously separated.

The Cross Section

The 1945 scheme varied the width of the Inner Ring Road from 90 to 110 ft, "according to anticipated need for the various sections of it" (Sheffield Town Planning Committee 1945). The Ministry of War-Transport recommended that the width of each lane for a dual-carriageway road should be 11 ft and the provision of a central barrier was preferred where traffic volume was higher than 400 vehicles per hour. This was much lower than the anticipated volume on the Inner Ring Road (ibid.).

No site specific detailed cross-sections were included, nor were concerned other than traffic volume which would impact on or be affected by the cross sections of the Inner Ring Road mentioned. This is arguable because such information was not considered necessary at this stage. Instead, the scheme presented a typical 100 ft wide cross section of trafficked streets in a shopping area (Fig. 8), probably to address the concern that "no official policy or guidance has been given in the matter of development to traffic streets in a City Centre" (ibid.), and to highlight the

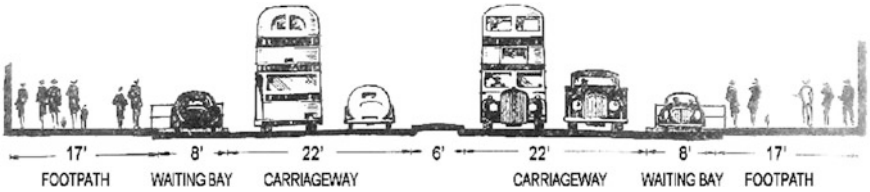

Fig. 8 Typical cross section of 100 ft wide for traffic streets in a shopping area in the 1945 scheme (*source* Sheffield Replanned: 44)

Committee's ideas in dealing with this type of street, which, though concerned about amenities for pedestrian, insisted that enough carriageways should be provided for traffic purposes.

The Roundabout

Proper frequency and layout of intersections are among the principal factors in determining the capacity and safety of a road. While American cities were in favour of multi-level intersections, it was pointed out in Britain that these elevated constructions were destructive to ground development and were not suitable for cities in the UK (Power 2007). Instead, roundabouts, which are much more modest in scale than flyovers, were widely adopted for their efficiency in "control with continuous traffic movement" and avoiding right-hand turning (Minister of War Transport 1946). Both the 1939 scheme (Fig. 4) and 1945 scheme (Fig. 6) clearly showed intentions of using the roundabout on the ring roads.

However, the rejection of the flyover does not mean the road would readily be compatible with the existing layouts or future development around the intersections. The design of an efficient roundabout was supported by a series of geometrical theories and formulas, and though concerned with the land acquisition, not enough emphasis or proper suggestions on dealing with the surroundings had been made during the mid-twentieth century (Minister of War Transport 1946). However, in Eugene Hénard's gyratory intersection drawing (Fig. 9) Paris's city architect represents an early vision of the roundabout idea. It is surrounded by building shaped to fit the gyratory intersection. The special enclosure at intersections of some main roads in Paris had an inherent advantage in being integrated with this new system.

While few groups of buildings were arranged around an intersection in this way in Sheffield, the application of the roundabout was adopted as a standard without much question. Its adoption would reshape the development at many other intersections and created a new type of space, differentiated from the existing ones regarding form and scale, but few concerns about this were mentioned in the schemes. While there was no objection to this new space, few efforts seem to have been made to create a sense of space around the roundabouts in later development.

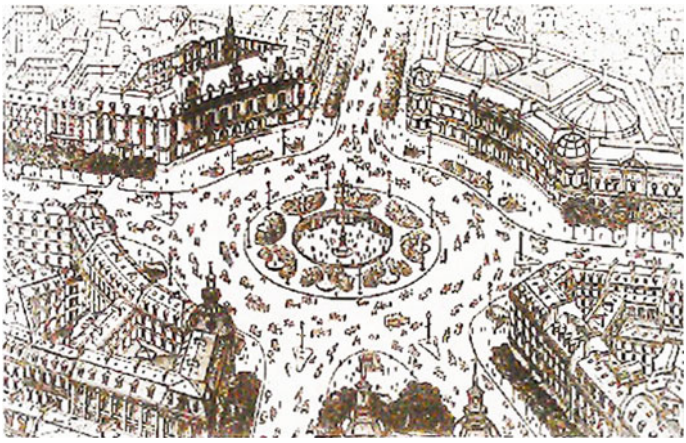

Fig. 9 Hénard's gyratory intersection (*source* A history of Sheffield's central area planning schemes, 1936–1952: 254)

Impact and Indication of the Inner Ring Road: Some Negative Impact

The old schemes of the Inner Ring Road were mainly led by professionals with an engineering background, and the choosing of routes and design and layout of road sections were to a great extent simply drawn on road engineering theories. This led to a lack of concern of, or emphasis on, how the new road could be integrated with urban frontage and amenities (Lewis 2006).

Though laid out mainly by linking and widening existing roads, the Inner Ring Road schemes required massive demolition for the roads' incompatible large widths. While the east half of the ring had already been serving as an artery along the urban edge where a semi-regular and relatively low-dense network can be found (Abercrombie 1924), the west half ran through the area where the small and narrow industrial grid dominated and a sense of superimposing of two different types of fabric is rather perceptible there on the scheme map. What contrasted to the existing layout even more than the wide new curves were the large roundabouts, which distinguish the Inner Ring Road, as well as the proposed Civic Circle, from other roads within the network. Thus, a new structure would be formed once the Inner Ring Road scheme was carried out, calibrating the urban fabric of Sheffield just like the way in which post-war buildings stand alongside more local and traditional ones.

From the angle of a person on the ground, the road would be outstanding and powerful enough to compose an image which would very likely be perceived as the typical cityscape of Sheffield by people travelling around the city centre, for it would link up the gates of the Central Area, be frequently used, and have a distinctive spatial feature which has a high level of "visual exposure" (Lynch 1960).

However, here the impressive distinction became monotonous on a nationwide basis, with the roundabout not being synonymous with Sheffield. Instead, it belongs to a period of time in the history, which has an emphasis on rationalism.

The ring would also, as it does today, separate and detach activities which used to be tied up with the Central Area. The commercial business on London Road was an extension of that in the Moor, but now the two parts are totally separated. The two campuses of the University of Sheffield were gradually growing into an undivided one, but the construction of the ring road made the effort impossible. Convenience and continuance of these activities along the ring would have to be sacrificed if free movement of motor traffic was to be achieved.

Enthusiasm in Progress

While quite a lot of dispute took place on road schemes within the Central Area where purposes of the roads were more complex (Lewis 2006), it seems few objections against the Inner Ring Road were raised by the Committee and the concerned institutes. This might partly be attributed to the clear and single purpose and the urgent need for the road as well as the prevailing technical and engineering approach and enthusiasm in town planning and architecture at the time.

In the 1939 New York World's Fair, General Motor's Futurama Pavilion envisioned a highly motorised urban landscape in the future with elevated highways, segregated traffic flows and vast suburbs (Fig. 10), prophesying a futuristic dreamland "regulated by an assortment of cutting-edge technologies" for people to expect and pursue (Morshed 2004: include page number). While cities like Sheffield would not appreciate this design, the ideas of order and efficiency, which represented progress, were praised, especially in the post-war time. A high-quality highway system was not required solely to serve practical needs, but in many cases, it also showed achievement in urban development, motivated by the sense of civic pride (Power 2007).

There is no evidence which directly suggests that the idea of the Inner Ring Road in Sheffield had this kind of motivation however due to the fact that Sheffield was once known as an ugly and misshapen city in the early twentieth century (Orwell 1959) and effort to change the situation had been revealed in 1924 plan. In the planning schemes for Sheffield during that time, advanced but destructive proposals to resolve traffic problems within the Central Area were not only favoured by engineers, but also appealed to planners (e.g. the high level bridge over the Midland Station by Abercrombie in 1924) and architects (e.g. a series of urban designs for Sheffield city centre by Bennett in 1935). The ambitious Inner Ring Road, though laid on ground level, would surely be functionally helpful, and no less imposing regarding providing a progressive and inspiring urban image.

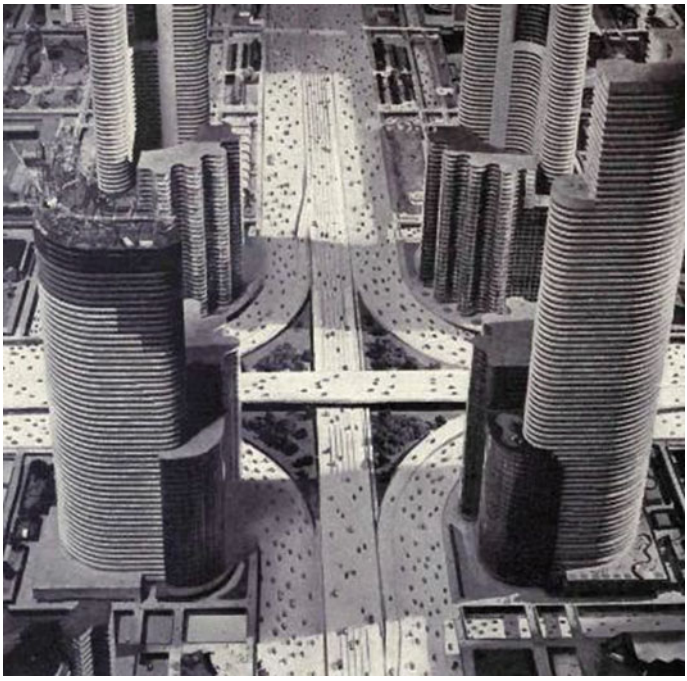

Fig. 10 City in the future in General Motor's Futurama Pavilion (*source* http://www.notechmagazine.com/2009/05/magic.motorways.html, re-accessed on 7 March 2016)

Central Control and Elitism

It would hardly be possible for the City Council to carry out the Inner Ring Road scheme before the issue of the Town and County Planning Act 1932, which allowed the responsible authority to purchase by agreement any land to which a scheme applied (Lewis 2006). The idea of comprehensive development, or redevelopment, was regarded as so beneficial (Power 2007) that it seemed to be a necessity that governments wanted the power to realise.

However, the 1945 scheme was just a preparation for the final scheme and was never formally approved (Lewis 2006). After negotiating with railway companies, who hold a greater control over their land, two large roundabouts on the Inner Ring Road have been entirely altered. Many other groups or individuals were also engaged in the consultation (ibid.), but contrastingly, not much compromise seemed to have been achieved. Instead, constructions of improved scale for the Inner Ring Road were proposed during the later years (Sheffield Town Planning Committee 1969).

It may also have been a result of the dominant authority of relevant professionals at that time. The planners and politicians in the 1940s, "assuming power over the

enormous and complex process of bringing a city to order", were playing a "messianic role" with the assent of the people (Higgott 2007: author to include page number). Promising proposals for the Inner Ring Road and the engineering and rational way drawn up were convincing. Specific knowledge required to plan a modern city alienated the public, weakening their ability and willingness to participate.

Nevertheless, criticism against large programmes which facilitate motor traffic appeared in the 1950s (Power 2007). With the erosion of government power and the awakening of the grassroots, construction of extensive road system had become far more restricted and resisted since the 1970s (Gandy 2002). By 1977, only a small part of the Inner Ring Road had been started and the road standard reduced (Sheffield Department of Planning and Design 1977). More concerns had been raised when construction went on during the succeeding decades (Sheffield City Council 1988, 1993).

Conclusion

The schemes of the Inner Ring Road in the mid-twentieth century were motivated by the emerging need and enthusiasm to serve the soaring motor traffic and were supported by the planning theories and social ideas at that time. In the schemes discussed here, the road was conceived as an ordered and efficient system to improve the whole city. Few details of the road were depicted in these plans, nor were they needed. Still, the schemes indicate that it is enough to reveal the strong concerns of motor traffic needs and scientific engineering priority. Meanwhile, the consolidation of government power and people's trust in the new world created by the elite made it more probable for the schemes to be proposed and accepted.

Regardless of its shortcomings, the Inner Ring Road remains to today indispensable in releasing the traffic congestion in Sheffield. There were always different thoughts and values in various eras, and the ultimate purposes were all to make a better world to meet the current and future needs. The problem with earlier urban priorities was that they developed at often too rapid pace, always ending up focusing on a particular type of concerns while overlooking many others. After more than half a century, the Inner Ring Road of Sheffield was completed in the 21st century. The outcome is more harmonious than the original concept, but as a classic pattern of the road, its idea and basic features are retained. The urban framework it shaped and the movement order it leads still follow and reflect the original vision of the schemes made in the mid 20th century. Practically, the Inner Ring Road is an essential urban infrastructure on which the city relies to work and develop, but also, it is a horizontal monument, which conveys some ideas of past urban agendas in the UK.

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Strategic Design: Implications for Wider Practice

Jordan J. Lloyd

Abstract Strategic Design is characterised by a deep understanding of the complexities of a particular agenda and pursues a research and expertise-led approach to developing clear strategic intent, imaginative vision, and a variety of ways to achieve solutions. It involves designing better decision-making, a chief proponent of strategic thinking. It has significant value in helping policymakers make decisions where eighty percent of the environmental impact of products and services at the design stage. Architecture graduates and practitioners trained in Strategic Design are effective stewards of the entire authorship process because they can deliver tangible and qualitative outcomes that positively contribute towards managing large-scale transitions. In this chapter, Strategic Design is framed within the broader context of contemporary design education discourse that proposes that architectural education in the United Kingdom may benefit greatly from conscientiously preparing its graduates in fields other than the built environment. Using Finland's Helsinki Design Labs studio model as a foundation, the implications for Strategic Design's role in the wider field of urban development has significant implications for re-defining the role of designers and architects in practice.

Keywords Education · Resilience · Adaption · Strategy · Design

Introduction: Design Education in the 21st Century

Design education has reached critical importance over the last decade as institutions and big business interest in design-led strategy, creative thinking for innovation, and the omnipresent issue of sustainability has dovetailed traditional business school teaching with more traditional design programmes. With design-led strategy being taken seriously by businesses and governments, there has been a noticeable increase in the number of applicants for these design-oriented courses. Popular 'D'

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schools such as Stanford's Institute of Design d.school (Geer 2012), who offer a non-degree design strategy programme now receives several hundred applications a year. Further, afield, an OMA-designed one-year masters course covering design, media and economics are offered at the privately funded Strelka Institute in Moscow (Morarjee 2012). With design led education traditionally established in Europe and North America, the fastest growth sector in this more integrated design approach is unsurprisingly in Asia (Woyke 2007) where many universities now offer courses that mix traditional business with design insight, teaching graduates the valuable skills needed to tackle the broad framework of sustainability in their respective geographical regions.

While this focus on more strategic led approaches to design represents the most interesting growth area in design education, traditional design led education programmes, particularly in architecture may not be adapting quickly enough to meet the demand. This creates an opportunity to examine the best practices of architectural education, to define what skills need to be taught to students, and more importantly; how students might be educated in fields other than the built environment.

A Missed Opportunity

Arguably one of the greatest strengths of architectural education lies in building the foundations for comprehensive knowledge in a very broad range of fields. The *Guardian*'s former architecture and design critic Jonathan Glancey remarks that architectural education in the United Kingdom is "both happily demanding and hugely varied. Which other university course combines art, science, mathematics, history, philosophy, politics, economics together with some understanding of media and marketing?" (Glancey 2009). Eric Cesal, architect and author of *Down Detour Road*, attributes desirable qualities to architectural graduates in the form of being able to "think synthetically, to rapidly oscillate between massive scales and tiny ones" as a fundamentally useful skill set to engage with the future (Cesal 2011: 14). However, it would appear there is a significant disparity between these immensely useful skills that can be applied to what designer Mau et al. (2004) calls 'the design of the world', and architectural education's preoccupation with preparing its graduates for a profession within the construction industry that is characterised by its slowness, significant risk and capital expenditure; in addition to an undeniable trend in the eroding authority of its practitioners, as decisions about architecture are increasingly being made by parties other than architects. This may appear to be a rather pessimistic view of the profession (certainly in the United Kingdom), but the results speak for themselves.

For instance, the rate of unemployment during tough economic times results in unemployment in architecture being eight times higher than other professions (Cesal 2011: 25); There has been a marked trend in the recent architectural press of stories of big business folding, or moving abroad to stem the flow of redundancies. In the United Kingdom, official figures for registered architects seeking Job

Seeker's Allowance hovers at the one thousand mark (Rogers 2012), with one-fifth of the UK architects unemployed (Klettner 2013). Typical architects' wages are disproportionately small in comparison to the mandatory period of training (and subsequent debt accumulated) compared to other disciplines with a similar length of mandatory training (Fig. 1).

Slow action on behalf of the United Kingdom's architectural regulatory bodies; in particular, the Royal Institute of British Architects (RIBA) to prosecute practices that knowingly exploit graduates is an issue too. In 2011, RIBA (Etherington 2011) pledge was to reprimand practices that cannot guarantee the minimum wage of £5.72/h, which has upgraded to £7.86/h recently (PayScale 2016).

These results are not encouraging for graduates whose perception of the architectural profession does not match the current reality. However, as Cesal (2011: 25) summarises, these are just side effects of a much broader and more insidious decline of architects' cultural validity.

This is in part because of the obscure nature of design and its fundamental lack of defined purpose at the core of what architects do (primarily in the context of the built environment), certainly to the general public (ibid.: 44). For a rather poignant example of this lack of definition, the recently implemented National Planning Policy Framework document that sets out the future of the built environment states in clause 9 of 'Achieving Sustainable Development' emphasises a need for

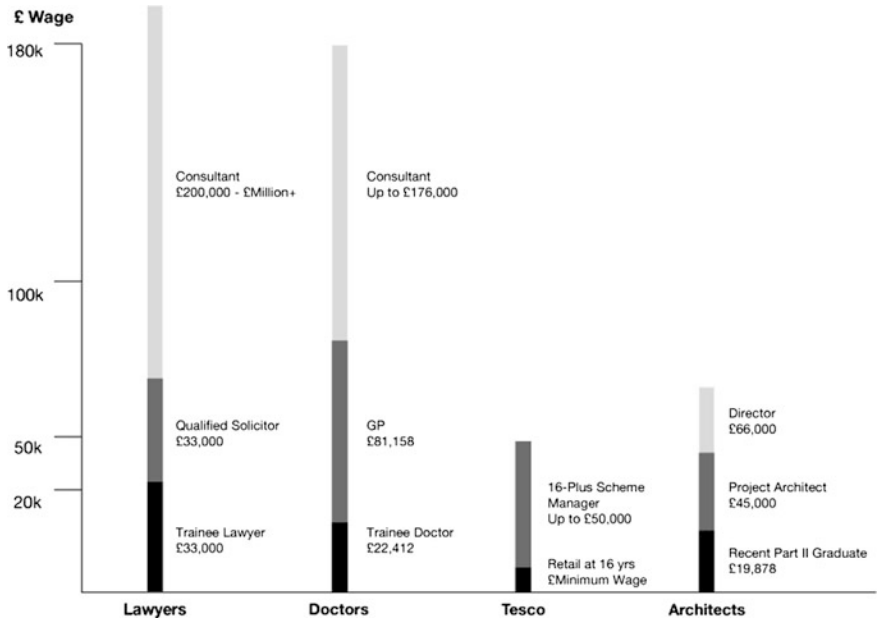

Fig. 1 Wage comparisons in the United Kingdom of professions with a similar period of training (Author) (*sources* 2009–2010 figures from *The Times,* NHS, *The Independent*, RIBA and Prisma Recruitment)

'replacing poor design with better design' (Clark 2012: 3). If we struggle to define design from within the profession, then we lose our market credibility.

There is a well documented, enduring trend of perceived successful architects operating at a large scale; both in the number of projects and breadth of territories in which projects are located. In the same way, that architectural education across institutions is noted for its diversity, so too is practice, and with it, the parameters of what constitutes a successful practice vary.

Also, the intangible but undeniable benefits of a well-designed project are difficult to quantify; something that the financial and insurance services have done considerably better within a very narrow field of value. The result is capital expenditure for any built project being unable to be reconciled with genuine long-term value: Moreover, as any architect will tell you, much of the worth of well-designed projects is stripped out, especially in projects where the goal of the eventual product is not one of cultural significance or performance, but simply as a profit generating asset.

Other professions, including the relatively new field of Project Management, have driven a firm wedge in-between the architect and the client as they can exploit the opportunity found in the increasingly complex procurement process of the built environment; and as such, can absorb liability—and with it—ultimate responsibility. This, as architect Joshua Prince Ramus (REX 2012) comments, has reduced the role of architects to one of '(impotent) stylists', making superficial resolutions, while genuine decisions about architecture are made by not architects. From a market perspective, Cesal notes that we can no longer clearly define what separates us from other professions as we could in the past. This is compounded by the United Kingdom's regulating bodies' mandate extending to the protection of title, and not of function.

Mitigating this downward trend may reside in identifying new opportunities and adapting as fast as other industries. One opportunity is the potential of design led strategic training in architectural education because of its ability to reconfigure architecture's existing processes, so as to begin to define our value to the culture at large within and outside the profession. This value is not possible through solely exploring emerging technologies and their application in the built environment, but perhaps, as an advertiser and author Rory Sutherland suggests, value often exists in experimenting with small interventions. "Small, stupid interventions," Sutherland (in Lloyd 2012). Argues, "may actually be the future of progress. Most of them will fail, but the big ones will have been disproportionately successful". Furthermore, making a systems-based approach to design more mainstream within architectural education can consolidate our market differentiation from other industries.

If we were to reconfigure this process that allows architectural education in the UK to generate value above and beyond its current remit of preparing its graduates for the construction industry, then it must firstly address its current inability to produce practising architectural graduates. Statistics published by the RIBA have noted a consistency in which just one-third of students entering architectural education become architects (Brown 2011) (Fig. 2).

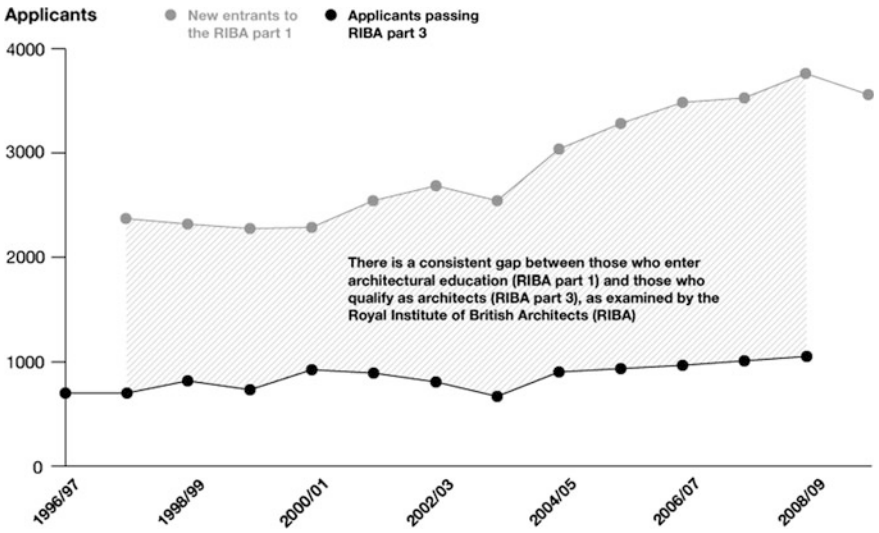

Fig. 2 RIBA Part 1 Entries and RIBA Part 3 Passes, 1998–2008 (*source* Redrawn from Brown 2011)

To reiterate Glancey's point, the vast opportunity for those skills that are acquired over the course of architectural education, is that instead of preparing its graduates for a narrow profession in the built environment; it may, in fact, be an ideal vehicle conscientiously to prepare the other two-thirds of graduates to apply their comprehensive thinking in other fields beyond construction alone. This kind of broader transdisciplinary education may define the future of progress for architecture graduates, in a way that suits work life more effectively.

Design-Science

In 1956 the M.I.T's Creative Engineering Lab offered a curriculum in Comprehensive Anticipatory Design-Science, developed over the course of the preceding thirty years by famed author, systems theorist, engineer and architect, Richard Buckminster Fuller. Initially covering eight components ranging from strategies of Geographic Reconnaissance to Economics (Fuller 1956), the outcome of the Design-Science was to maximise an individual's thinking across a broad spectrum of subjects. Fuller's intention was to initiate an 'industrial realisable', 'comprehensively operative' design methodology that would recognise the potential of humanity without doing harm to the environment (Cook et al. 2012).

The success of Design-Science as a design methodology for effective practical application hinges on its emphasis on the general rather than specific (Fuller 1982: xxvii). Specialised knowledge is rejected in favour of developing comprehensive

literacy and managing the process and outputs on an ongoing basis. To maximise the potential and application of a broad, synthetic means of thinking, Design-Scientists employ conceptual tools to help make sense of information and give it meaning. Design-Science may be analogous to a phoropter; the device in which opticians use to determine an individual's eyeglass prescription, in which different combinations of lenses are applied to focus—in this context, focusing on identifying opportunities and designing strategies to manage challenges on an ongoing basis.

This research is based on the exploration and utilisation of generalisations, that is, Fuller's (1982: xxvi) intended science-oriented definition of the word concerned with finding principles that hold true in every particular case. In the same way, Modernism searched for universal truths in architecture in the twentieth century, applied study and synthesis of variability will reveal new value networks, universal principles and outputs for architects and designers in the twenty-first century. If reviving Fuller's Design-Science is the proverbial phoropter, then one lens designers may apply that of Strategic Design—a means to design better decision-making. As the prominent design theorist Thackara (2006: 17) notes, "eighty percent of a product, service, or system's environmental impact is determined at the design stage". Therefore, we should be paying closer attention to how we make crucial decisions at the design stage; and begin by asking better questions through Strategic Design.

Diagnose Problems: How to Ask Better Questions

To appreciate and understand the value of Strategic Design, it is necessary to define firstly what strategy is, and what makes Strategic Design different—and arguably more valuable—than traditional perceptions of design concerned with the creation of artefacts (Jones 2009). According to Harvard Business Professor Porter (1996), strategy is the "creation of a unique and valuable position, involving a different set of activities". Business Author Richard Rumelt (2011: 7) notes that a good strategy contains three core elements:

> […] a diagnosis, a guiding policy, and coherent action. The guiding policy specifies the approach to dealing with the obstacles called out in the diagnosis. It is like a signpost, marking the direction forward but not defining the details of the trip. Coherent actions are feasible coordinated policies, resource commitments, and actions designed to carry out the guiding policy.

At the heart of Strategic Design is the fact that things we can measure and understand how to allow us to ask better questions, create the tools to make better decisions so we can tackle the 'wicked problems' (Brown 2011) and help institutions navigate through uncertainty. Strategic Design is characterised by a deep understanding of the complexities of a particular agenda and pursues a research and

expert-led approach to developing clear strategic intent, imaginative vision, and a variety of ways to achieve solutions.

The Helsinki Design Lab, an offshoot of Finland's innovation fund Sitra (2012), is developing Strategic Design through a studio-based model common to schools of architecture. This carefully orchestrated studio model outlined by their first publication *In Studio: Recipes for Systemic Change* allows for an interval where carefully selected experts navigate their way through complex issues and generate tools and strategies to enable better decision-making at the policy level. The initial phase of the model is concerned with effective diagnosis by drawing together some experts from different fields and placing them within a specified location, time frame and agenda (Boyer et al. 2011: 97).

In one of several detailed Strategic Design exercises outlined in *In Studio*, eight participants ranging from representatives of the Finnish Ministry of Economy and Employment to the Department of Psychiatry at Stanford University tackled the agenda of Finland's aging population over the course of a working week (ibid.: 78) A detailed brief compiled by the Helsinki Design Lab up to 9 months prior (ibid: 134) to the studio based Strategic Design exercise frames the issue of the imminent retirement of Finland's baby boomer generation:

> As Baby Boomers retire, every level of society will be affected - from the individual to the institutional - with particular attention focused on the interfaces between these different groups […]. Welfare systems will have to evolve along with the constituencies that they serve if both are to continue with dignity into the twenty-first century (ibid.: 275)

> Proposed solutions are often accordingly framed in economic terms […]. As a result, Finland continues to lack a meaningful strategy of significant momentum to address the issues raised by the presence of a rapidly ageing population (ibid.: 279)

The comprehensive briefing document provided a concise, detailed overview of not only Finland's existing welfare system, but also a broad spectrum of demographic factors such as cultural impact and physical requirements. The research document (Fig. 3) even outlined the requirements for an effective design strategy; calling for striking a balance between the medical and social approaches for interacting with the target demographic, cross-party and inclusive of other groups such as private enterprise or churches (ibid.: 280).

From a careful study of the diagnosis, the studio generated a guiding policy based on three core tenets. The first tenet was that of the opportunities afforded by the target demographic of Finland's 55–64-year-olds being on the whole 1.5 times wealthier than the national average. This frames their inevitable retirement as a means to generate business growth by meeting a demand for new categories of products and services aimed at time-rich and affluent baby boomers. The second tenet involves formalising a desire for Finland's target demographic to engage with social networks beyond work-related needs in the form of a social contract. This would allow the aged to participate actively and contribute to society. The third tenet was to reconfigure Finland's institutions with a focus on innovation to more effectively engage with society while retaining their validity (Boyer et al. 2011: 82).

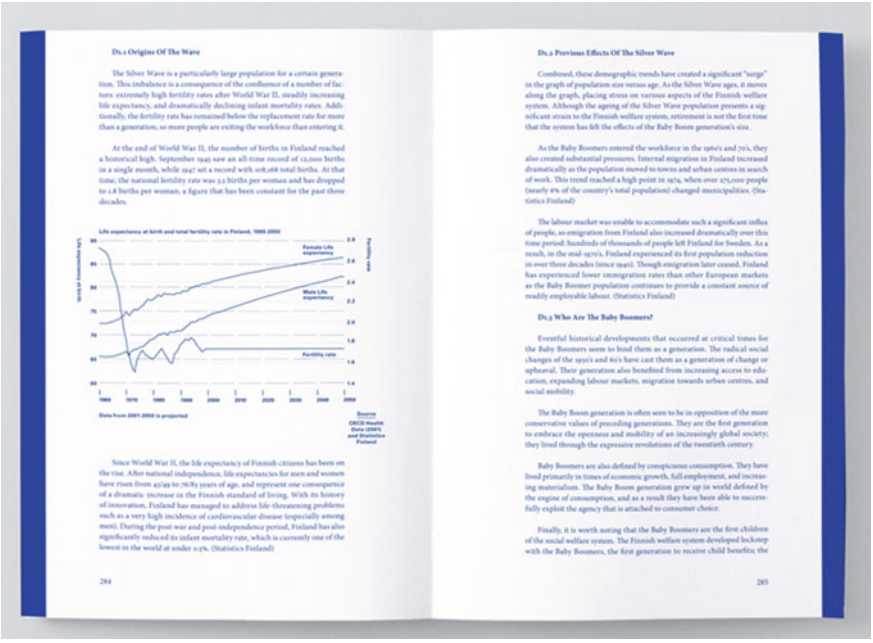

Fig. 3 A typical spread within the Helsinki Design Labs' briefing document (Boyer et al. 2011: 273)

Coherent actions based on this framework included the creation of a 'National Wisdom Bank' that enables informal knowledge transfer, an emphasis towards a 40-year trust–instead of a traditional pension–and to bring greater attention to volunteering in Finland. This reframing of the ageing population, not as a burden but rather as a new opportunity, allowed the group to challenge existing policies and propose viable creative solutions in addition to framing new opportunities (ibid.: 83). The vehicle of delivery compounds the relative success of this particular exercise; a studio-based model that is familiar to anyone in architecture or design education, to which the Helsinki Design Lab attributes part of its success.

Conclusions and Recommendations: Redefining the Architect, Their Practice, Values and Methods of Problem Solving

Strategic Design exercises such as tackling Finland's ageing population represent just one of many problems in which a 21st-century design education is well suited. The Helsinki Design Lab attributes the success of its Strategic Design model in part to a nominated steward to help guide the studio week. Unlike the traditional linear

design process deeply rooted in the profession of architecture (exemplified in the United Kingdom by the RIBA's work stages), stewardship draws from a more systems-based approach, in which analysis and execution are in constant flux using a cyclical feedback mechanism that is managed on an ongoing basis.

Within the appendix of *In Studio*, an incomplete list of desirable attributes for Strategic Designers for stewardship is listed. These include embracing constraints, persistence, iteration, translation, propositional thinking, leveraging intuition and a need to model/prototype (Boyer et al. 2011: 327). These attributes arguably represent a core skill set that naturally develops over the course of architectural education in the UK, and therefore make an effective match for application for the stewardship role found in Strategic Design as defined by the Helsinki Design Lab.

Our ability to visualise and our increased episodic memory capacity and optimism are further traits that integrate well with both the stewardship qualities listed above and Cesal's (2011) emphasis on rapid oscillation between scales and synthetic thinking. Furthermore, application of these traits can explore the spectrums of different professions, skills. Tangible and intangible elements to create the necessary material that a studio based Strategic Design exercise can build from.

Strategic Design may form one facet of a compelling and viable application of skills gained within architectural education if understood about (1) Continuing to redefine value; (2) Acknowledging that big problem do not require a big solution; (3) Accepting that we can not predict the future; and (4) Being a Fox not a Hedgehog.

There has been an emerging trend in recent years of increasing media coverage of initiatives where we redefine value that has been unquestioned since the rise of the Industrial Revolution. The concept of value is too large an issue to deal within the scope of this chapter, suffice to reinforce that we must consciously continue to shift away from value that is solely based on efficiency: universally recognised in the form of Gross Domestic Product and capacity utilisation (the maximum capacity for our manufacturing to produce goods and services that define our economies), towards one of effectiveness: finding value(s) in identifying and applying the right tool for the right job—and managing that value on an ongoing basis (Helliwell et al. 2012). Counter-intuitive to the challenges that approach like Strategic Design aim to resolve, complex systems do not necessarily require the application of a massive intervention (Lloyd 2012). This could not be truer of the planning and construction industry itself in which many projects are carried through to completion after an injection of a multi-million-pound capital investment. However, the study of complex systems yields that many determining factors towards the overall success (or failure) of any complex system may be through a slight reconfiguration of a single parameter, which induces a cascading effect (Raford 2012). In this way, leveraging this principle is why architects' skills are so important in experimenting with small interventions that could lead to huge innovations.

Acknowledging that big problem do not require a big solution is a difficult challenge considering the dominance of globalised capitalism that makes societies inclined to make decisions based on the narrow parameters of success driven by finance. Most forms of technical innovation occur at an incremental level (Jain

2012), where the measure of success (and indeed, process) is dictated by efficiency, goals and product based value networks, and not enough on the adaptive process. The great paradox is of course, that many of the biggest unsettling innovations—where market disruption is not necessarily through a new technology alone, but that occurs through adapting application—that modern societies take for granted has come about by accident, or by tinkering with an idea or invention in a new context (Latour 1981). According to Fuller (1982: xix), the most exciting discovery is that "local discoveries leads to a complex of further discoveries". This corollary is further compounded by the architectural education's unique position, and in turn, the profession's, to comprehend and act upon the variance of scale with which we engage on a daily basis, thus allowing architects, to arguably better than other professionals, best lever the 'small interventions' approach supported by Rory Sutherland.

Accepting that the future cannot be predicted is another key aspect of Strategic Design absorbed into studio teaching. According to Carroll (2007): "One of the patterns that we are looking to invite in our studio is the notion of looking beyond our normal boundaries, beyond our normal disciplines, really from a perspective of some humility, because architects and engineers are clearly quite confident, arrogant individuals."

In agreement with this position, Nobel Prize laureate and psychologist Daniel Kahneman illustrate that forecasts by experts in complex systems like picking stocks in the financial market are statistically wrong, and newcomers have just as much chance at performing well in such situations. While certain experts were able to extract wealth from amateurs trading in stocks, few, if any, traders can beat the market consistently and drive success through effectively predicting the future (Kahneman 2011: 214). This determinism is not limited to stockbrokers, but to most professions: architects in particular arguably can be considered very deterministic and that through the medium of the built environment we can change the world, and that we understand more than we do. When we acknowledge that we cannot predict the future nor control every aspect of it, or even presume to predict it, we can begin to focus on what very small things we can control—it is the difference between designing a top down solution and that of creating conditions for growth and opportunity, managed on an ongoing basis.

Borrowing from Berlin's (2013) 'The Hedgehog and the Fox', hedgehogs have a certain view of the world, in which predictions fall within a coherent framework. When those forecasts do not come to pass, 'hedgehog thinking' will attribute failure elsewhere, such as bad timing. Foxes think differently. The reality, according to a fox's more complex view of the world is the result of an enormous number of interactions between agents and forces that produce unpredictable outcomes. To achieve the greatest value for approaches such as Strategic Design, the architect-steward must think like a fox; utilising comprehensive knowledge across a broad spectrum, like that promoted in Design-Science, as a means to acknowledge the world's complexity and work within it. As noted before this value may be generated as a result of the persistent application of small interventions that arise out of this intersection of complex relationships and interactions.

In conclusion, Strategic Design offers one of many approaches in exploring how architectural education's value may be most effectively applied to other fields. There is an opportunity to capitalise on our comprehensive education as a means to provide market differentiation for the graduates of the twenty-first century, and in doing so regain part, if not all of our diminished cultural validity. This will only be possible if architectural education in the UK makes a more conscientious effort to acknowledge the many career potentials for its graduates, re-evaluating its primary remit of preparing graduates for the construction industry, and begin to explore how a comprehensive, transdisciplinary education and resulting skill set may best be applied to generate new opportunities and value.

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Bionic Science as a Tool for Innovation in Mega-Cities

Rosa Cervera and Javier Pioz

Abstract The conquest of vertical space in the context of architecture and construction appears to be one of the smartest solutions in the quest to balance the current overpopulation and energy consumption rationale of our mega-cities. However, actual structural models of vertical construction are exceedingly restricted. Upon reaching the 500/650-m high frontier, considerably large amounts of construction material are necessary to complete just below 30% of the built up area. Bionic Architecture contains a myriad of innovative tools that enable the development of groundbreaking designs for vertical engineering. Nature provides us with countless examples from which we draw ideas. When we observe a tree and how its structure works, we see a complex system of veins and fibres, which have an amazing capacity to resist strong winds and also to conduct fluids. This self-regulated natural system is an ideal model to "imitate" when designing high-rise skyscrapers, which, similarly, fight against the wind and hold shifting masses of people. The application of bionics ranges from improving the aerodynamics of aircraft and creating water-resistant surfaces, to designing and building pioneering high rise ecological skyscrapers and revolutionary Vertical Cities that are capable of sourcing the energy and accommodating up to 100,000 people. The Be-Bionic City Tower is a pioneering architectural design of a Vertical City, and the first high-rise structure to reach 1228 m. high. It is also the first fully self-sustainable vertical construction, which means that it can fully satisfy its energy needs drawing from natural resources such as sunlight, wind and rainwater. Experimenting with Biological Structures and their application to new construction models in the Be-Bionic City Tower is the starting point to create a new area of practice-based research in architecture, that of Bionic Architecture.

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Bionic Science: Living in and Through the Teachings of Nature

Bionic Science analyses biological species and natural systems to benefit human life. The majority of living species in our planet are but the result of two billion years of evolution and researchers study these living forms and use this knowledge to develop valuable, innovative systems. These systems aid our development as a society as findings can be applied to nearly anything from construction to health, design, architecture, and engineering.

When we look at nature, we realise it is a superbly developed high-tech organism where we encounter astonishing finely tuned mechanisms of coexistence, energy efficiency and immaculate equilibrium fully capable of adapting to a changing environment. These are all qualities we crave when we create a design. We firmly believe that by extracting, conceptualising and applying nature's knowledge and laws into our designs we can achieve the kind of sustainability the modern world so desperately needs (Gerardin 1968; Litinetski 1975; Otto 1987; Benyus and Barberis 1998).

We as Cervera & Pioz Architects investigate the growing patterns of organic forms and the flexibility and adaptability laws in nature to develop a novel "theory & practice" for an innovative connection between "nature and architecture" (Cervera and Pioz 2001). We aim to mimic nature's staggering efficiency by observing its geometric patterns and by studying the coherence between form and structure. Then we transport these concepts into our architectural work and develop sustainable and constructive techniques for our green buildings. To study bionics and "learn from nature to build our future" for us means to contribute to building a future that can meet the pressing demands made of the environment in a wholly sustainable manner.

Why Bionic Science?: Over-Consumption and Ecological Consciousness

The development model that modern society has used as the basis of progress is one of "steady growth", a model that is identified with the concept of "goodness" and that signals as negative any question that does not imply steady increase. This philosophy of unlimited expansion that lies at the base of the industrial and post-industrial society shamelessly shapes the unquenchable consumption of resources and the magnitude of human settlements. The astounding rise in demographics, the welfare of society and growth of urban settlements run parallel with some resources abused. Nature simply cannot produce at the same rate as human beings can plunder the environment.

The widespread awareness that humanity is throwing away at a vertiginous speed the heritage the Earth needed millions of years to accumulate is something relatively new. The barbarous attack on the environment has been relentless as exemplified here: phosphates of laundry products and fertilizers; the quicksilver of fuels and lead of the oil industry that pollute sea waters; both oxides of carbon, CO_2 and CO, coming out of exhaust pipes, chimneys, heaters and oil refineries have been spun into the atmosphere; oil spilled into the sea damaging the marine plankton; the gases in spray bottles and of freezers damaging the ozone layer; nuclear radiation and nuclear waste; all of them new challenges for the environment. Moreover, the global warming has only just started. Nevertheless, all these side effects were diligently ignored as the advanced society reached degrees of comfort and welfare unknown until then.

It is only now in the first few decades of the 21st century when the ecological attention extends to all levels/the whole, making us aware that cities have emerged as major culprits of unsustainable energy consumption, land occupation and are responsible for the highest polluting emissions. This requires the revision of all urban and architectural theories and practices to limit the waste of natural resources and the continued massive pollution of the planet.

Nature as High Biotech: From Research into Architecture Practice

Cervera and Pioz have been long conducting research around forms in nature aiming to find a path towards efficiency in constructive building technology. To get more for less could sum up our objective; in other words, to minimise material and energy expenses without renouncing to a variety or formal exploration.

In nature structure and form fully depend on each other and have an inherent relationship. It is clear that a vital need to optimise resources form a tight bond between the two. All the essential ingredients are integrally generated to be, and unlike artificial systems, they cannot be separated. We are convinced we must take the opportunity offered by nature to see it as a biotechnological process and elaborately engineered structure. Moreover, we believe that the ideal form can be coherently achieved starting off from here.

Here we put forward a few of the projects in place that are working towards investigating the formal and structural organisation of vegetables and animals (Sane 2003; Wang 2005). We follow a methodology that consists of identifying those elements that could be compared to their architectonic equivalents and draw our conclusions. Once the models have been determined, we analyse their formal, geometrical and structural configurations. From there onwards we study their behaviour and usually come across some strikingly innovative results. Using current calculus programs we can compare the different behaviours that occur in various settings. For instance, we observe a cantilever first in a context with structural elements displayed according to the original model previously identified;

and second, we observe it in a context faithful to the standards commonly used in construction. The analysis that follows observes the differing factors and studies optimum dispositions. We use this methodology to study all kinds of elements in nature like the slender shapes of trees or reeds; cantilevered forms like those of leaves or insects and birds' wings; the centrally supported forms of water lilies; the bends on cactus and shells; containing forms able to save energy like fruits and flowers; and dynamic forms like those of the manta ray (Figs. 1 and 2). During analysis, we also study structures at the microscopic level that provide us with new layers of information.

One example includes the investigation of the structural-formal organisation of water lilies by using parametric programs that enable the study of variations (Fig. 3). Here the structural model is similar to a cantilevered circular slab that relies on a central support. The shear and bending or flexors are studied and later compared to those of slab that has used a conventional reticular framework. The results speak for themselves; a much more efficient structure is that of the water lilies and their "radial-arboreal" organisation.

Cervera & Pioz Architects apply some of the outcomes of their research into their professional architecture designs. Several works have been developed and built by translating this research into practice resulting in structural and energy savings of 30% compared to more conventional models. The Twin Towers of Shristi in Kolkata, India (Fig. 4) base their structure on a triangular shaped superstructure similar to the skeleton of fishes that are capable of absorbing all torsion effects. Three built volumes hang from this primary structure creating a "building of buildings". Here the structural innovation has also resulted in a novelty typological height that considerably improves in structural savings and cross ventilation, a highly unusual characteristic in conventional skyscrapers but very well suited to the extreme climate in Kolkata.

The project design for Tai Da Plaza F.C. in Chengdu in China (Fig. 5) deals with the construction of a building with a large volume density of around 120,000 m^2 with a limit of 100 m in height. The solution achieved is in the shape of a tri-tower design. This innovative configuration for a high-rise structure has its structural roots in many natural species. The main purpose of the Tai Da Times Plaza F.C. design is to save energy and construction material by mimicking nature and creating an

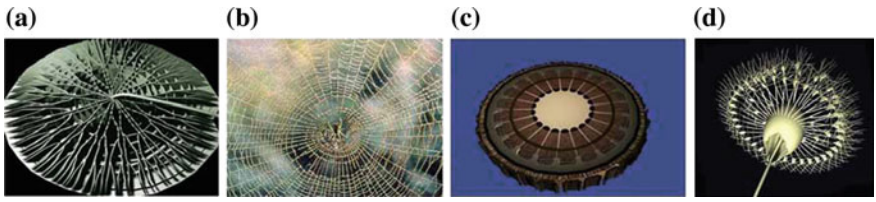

Fig. 1 Research around forms in nature to find a path towards efficiency in constructive/building technology: **a** Water lily leaf; **b** Cobweb; **c** Transversal section of a tree; **d** Dandelion (*source* Cervera et al. 2011)

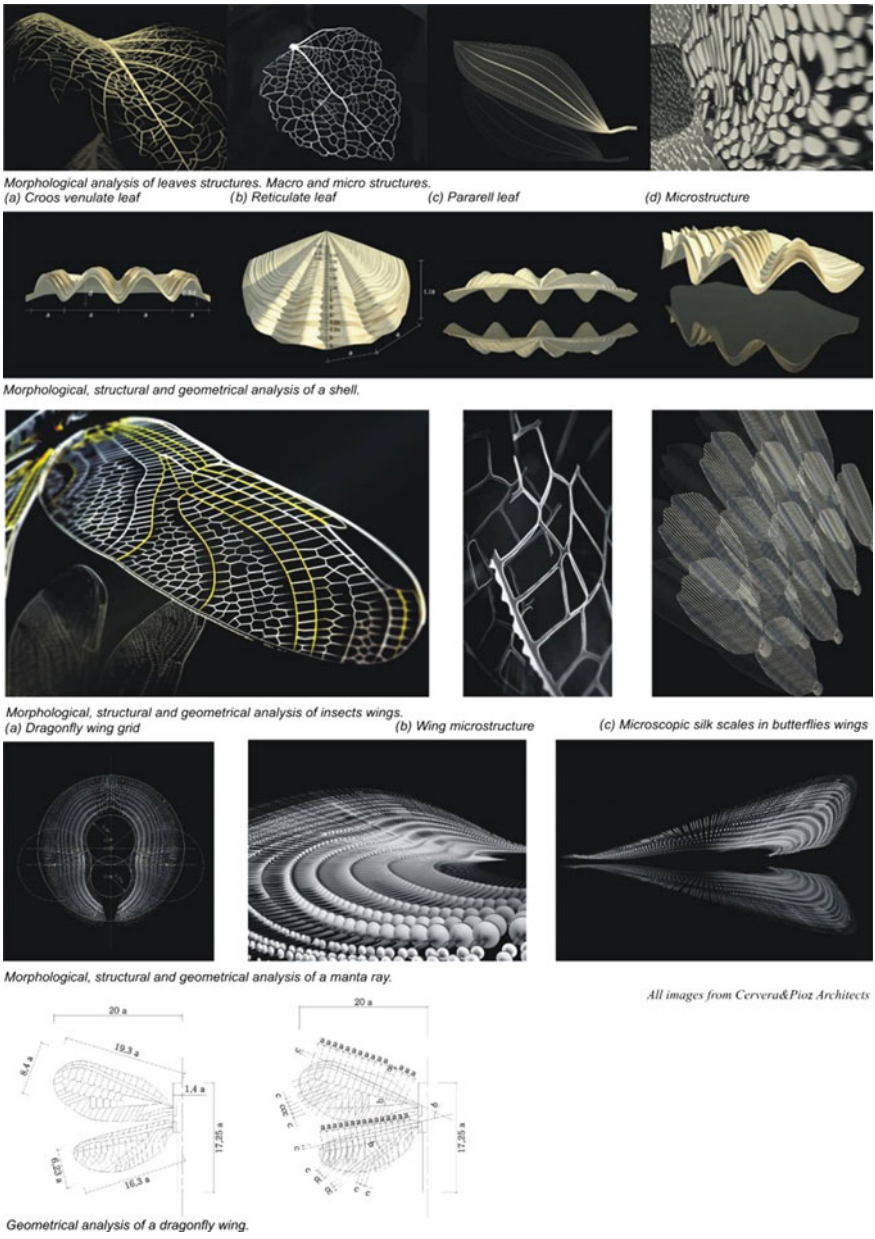

Fig. 2 Macro and microanalysis of biological organisms (*source* Cervera et al. 2011)

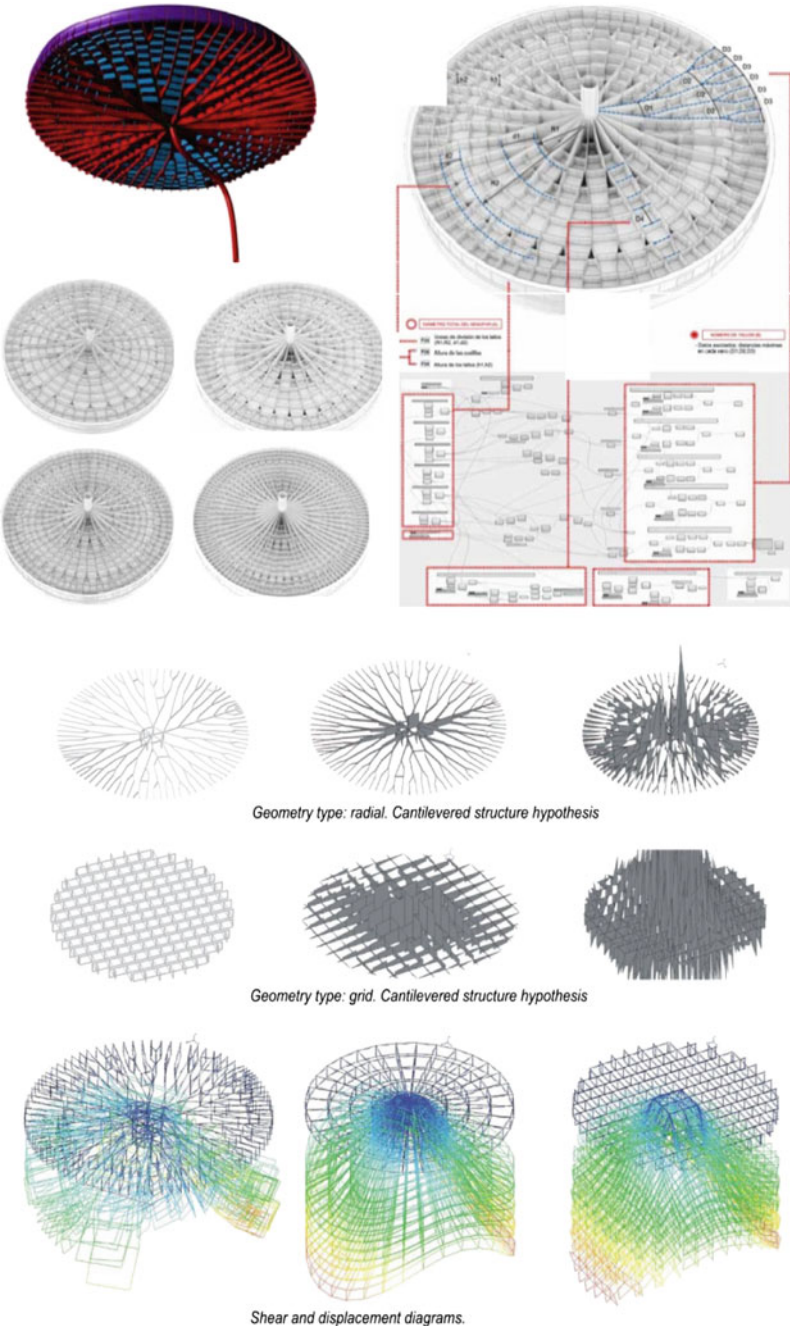

Fig. 3 Parametric Structural analysis of water lily leaf behaviour (*source* Cervera et al. 2011)

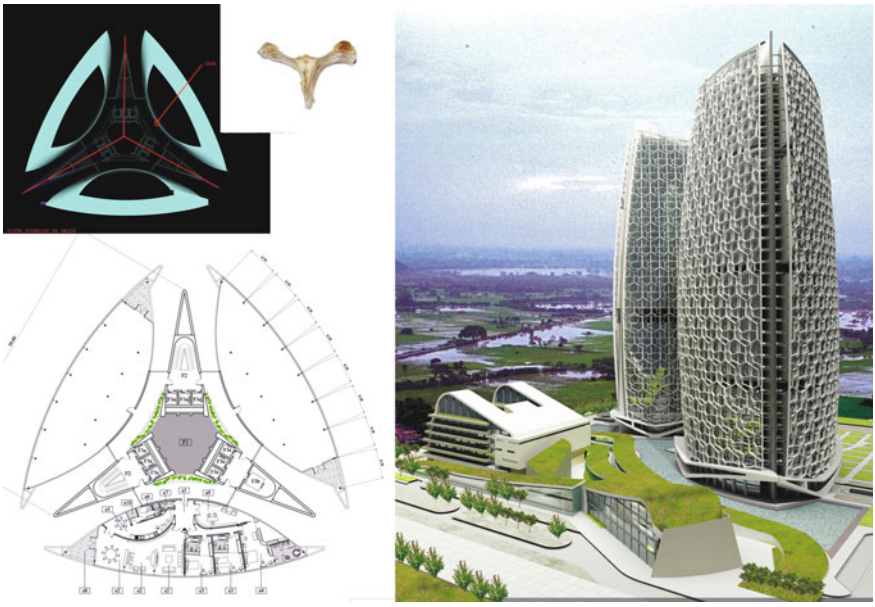

Fig. 4 Project of Twin Towers of Shristi, Kolkata, India. Bionic references taken from fish spine (*source* Cervera et al. 2011)

architectural form with maximum surface area and minimum volume. In comparison to traditional skyscraper office buildings, this groundbreaking architectural style includes a vast amount of façade surface that increases natural light and offers better views. By joining the three cores to a frame-resistant façade, the amount of structural material that is conventionally needed for this type of building is reduced by at least 20%. The inclusion of three cores also allows a much better and flexible organisation of working spaces and faster communication between levels. It also aids the free movement of fresh air through and around the building which acts as natural ventilation thus reducing energy consumption for cooling and heating.

The bridge over the river Hai He in the city of Tianjin in China (Fig. 6) was the place where a system we call "Bio-Structured Shell-Net" was developed. This model is based on the multifragmentation of resistant efforts that generate a form of cooperation between all elements which are characteristically light, flexible and stable. It is a concept that requires all pieces in the structure to work in simple traction and/or compression. This allows the dimension of pieces to be minuscule and thin and saves a noticeable amount of construction material and energy. We have come to understand what nature teaches us by demonstrating with simple tiny little pieces we can build forms/shapes that are very complex but also logical,

Fig. 5 Project of Tai Da Plaza F.C. in Chengdu, China. Bionic references taken from cactus (*source* Cervera et al. 2011)

Bionic Vertical City: A Self-sustainable Bio-structure

The pinnacle of our on-going research in bionics is the Bionic Vertical City (Figs. 7 and 8). It was born as a result of ambitious research undertaken by Cervera and Pioz in the early 1990s. At the time, we were exploring the possibilities offered by the application of Bionic Science to architecture. The results from the study of natural structures and their translation into the field of construction gave birth to a new model of the vertical structure that left behind the prototype known as a skyscraper and conceived the new concept of a Vertical City.

Fig. 6 Bridge over the river Hai He in the city of Tianjin, China. Bionic references taken from a silkworm (*source* Cervera et al. 2011)

Fig. 7 Be Bionic Vertical City placed in Shanghai (*source* Cervera and Pioz 2000)

Vertical Urbanism

The concern over the urban development of contemporary mega-cities that stretch without limit along the territory ignited the development of alternatives to the currently depleted urban models through a novel concept of a compact city. The fresh options provided by research on bionics were added to the urban designs and led to a proposal of Vertical Urbanism as a model for healthy coexistence with our environment.

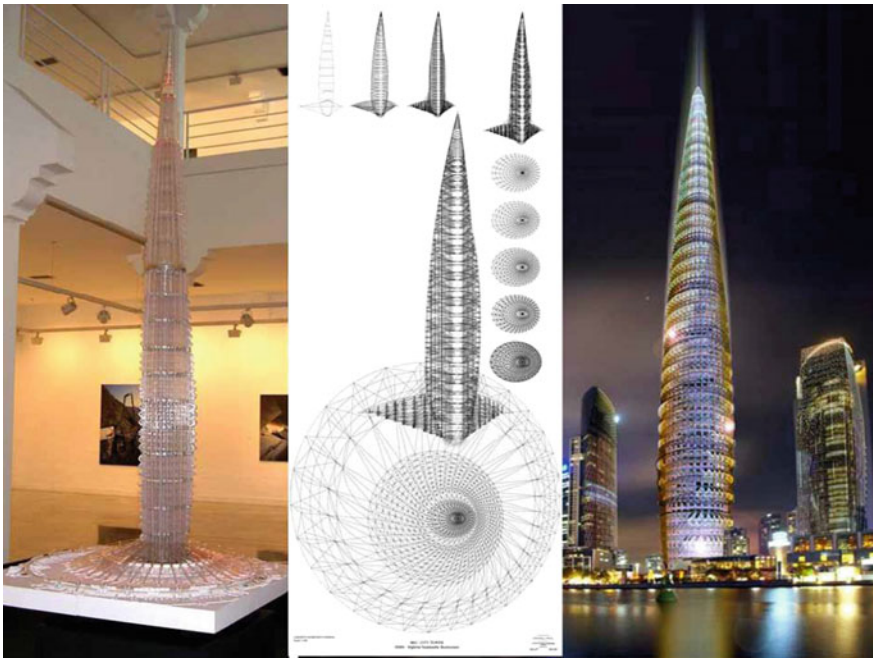

Fig. 8 Be Bionic Vertical City, model and perspectives (*source* Cervera and Pioz 2000)

The Bionic Vertical City is a new interpretation of the joint role that architecture and urbanism should play in the formulation of an eco-habitat, which is the balance between Nature and technology. It is a proposal for an eco-habitat able to: environmentally rationalise land use; save material through a more efficient structure inspired by natural structures; conserve energy through the use of natural resources such as the sun, air, water and humidity; and adjust its height requirements and usage to the different scales of urban and economic development of the city where it is located. Our proposal defines a new model for a city that grows vertically instead of horizontally. That new concept brings new solutions to reach a self-sustainable habitat. This Bionic Vertical Urbanism implies the returning of land to Nature; that is to "stop the concrete invasion" of land so an improved and respected environment is implicit within the concept. The Bionic Vertical City is not a skyscraper. It is a "novel theory for the city of the future", a city that is developed vertically instead of horizontally; and an innovative proposal half way between architecture and urbanism.

No doubt the figures of the Vertical City are striking: 1228 m in height (equivalent to more than twice the height of the Petronas Towers in Kuala Lumpur, three times that of the Empire State and four times the height of the Eiffel Tower), located at a lake 1 km in diameter; capacity for 100,000 people; 2,000,000 m^2 spread between the tower and the base; the equivalent of 300 stories; 368 elevators that move vertically inside the columns connecting the 12 vertically independent

neighbourhoods; multiple uses from housing to offices and hotels, as well as commercial spaces and equipment areas in a small scale, etc. are some of the data that tell us of the magnitude of the enterprise. It is like a "city within a city".

One of the most attractive assets is the presence of green spaces all throughout the Vertical City/Tower. These can take the shape of public parks or streets dotted with trees; or the central core that runs from bottom to top with lush greenery and, even, vegetable plots or gardens. What converts this mega structure into a real city, or what gives it the final touch that makes if feel like one, is the enormous amount of these green spaces dotted all over it and the public areas.

Bio-structure Model: The Bionic Vertical City Design Process

The most challenging difficulty we faced was how to design a frame or structure capable of reaching and bearing such extreme measures of height, width and weight. The first estimates made for the structure of a building of over 500 m high showed the limitations of current systems (Figs. 7 and 8), which increased when we considered mega-structures that clearly exceeded even that size. We had to overcome the conventional by developing a new structural model which we named bio-structure, which enabled us finally to overcome the height limits of current building procedures. The application of the results of research around the structures of natural species and the way in which they confront difficulties and find solutions was key in the development of our concept for a Bio-Structure.

We set about analysing a range of plants and took a closer look at the structure of tree trunks. A tree is a highly complex and efficient structure that can be used as a perfect and exemplary model of bioengineering. When observing a young tree, we see it is soft like yoghurt. However looking at an adult tree, we find that it is organised in two ways: on one hand, it has concentric rings; and on the contrary, it also presents a radial disposition. This disposition is the result of how it organises fibres, which are the most resistant materials, and veins, which are fluid and sap conduits. We also noticed the way in which the different fibre rings are organised to form a twisted shape. This particularity permits them to absorb wind efforts or the lateral loads the treetop faces. So it is the cooperation, or teamwork, of all these systems that enable a tree to reach extreme heights and still maintain such a slender appearance.

If we monitor the growth of a tree, we find that each year a new ring of veins is generated forming a very spongy crown. Taking a closer look at a vein, we discover that it also has a microstructure where the presence of voids or the presence of air is crucial. This is the reason why some trees are resistant to fire. This microstructure also allows fluids to travel upwards, and it also increases the tree's resistance by decreasing the weight of the trunk (Fig. 9). Our findings brought us to a

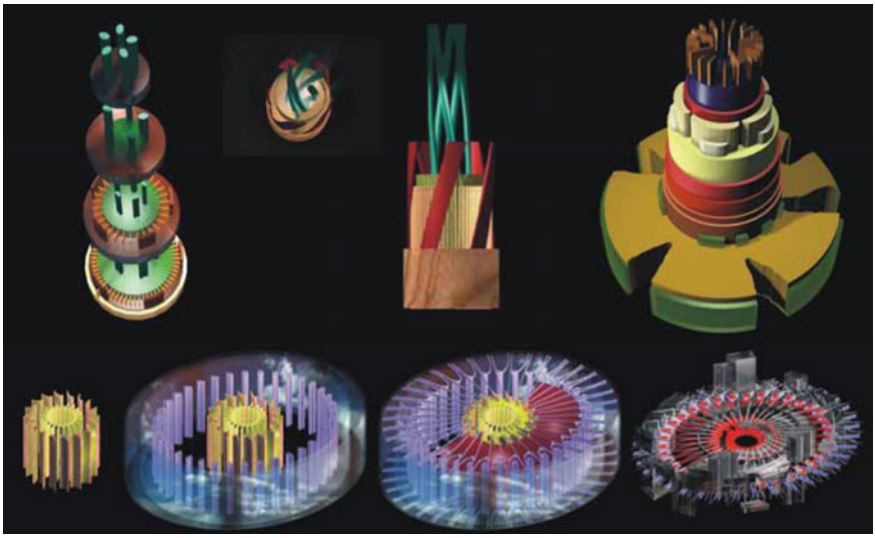

Fig. 9 Analysis of tree growth (*source* Cervera and Pioz 2000)

fundamental conclusion: what seems solid is filled up with air to a very high percentage. So similarly to human beings; we may look solid, but in fact, we are up to 60% water.

As we widened our research into the animal world, we investigated various structures and inner resistant systems in birds, fish, and so on. For example, if we study the skeleton of a bird, we can achieve an understanding of its highly specialised ability to fly, with its powerful keel and lightweight bones. Delving deeper into its core structure, we open and look inside one of the bones that form the wing. We find that it consists of a like pneumatic structure, so we are again reminded of the fact that the presence of air inside a truly resistant structure is strictly fundamental. Repeating this exercise with the sectioning of a feather, we can again appreciate a similar constitution: there are solid peripheral structures and a micro-structured air filled inner system. This pattern is followed as we continue to delve deeper and closer into the bird's structure. It even happens with a piece that measures just 0.02 in. These observations confirm that a fractal structure repeats a similar pattern at all scales to constitute lighter bones.

A very significant conclusion was reached i.e. Nature does not build structures the way human beings do. In conventional construction, when we have a load or significant weight we use columns and beams to support it. If the load increases, we proportionally increase the size of the parts that support it, which also increases the weight. If there is a load to be backed up in the Natural world, a net is built

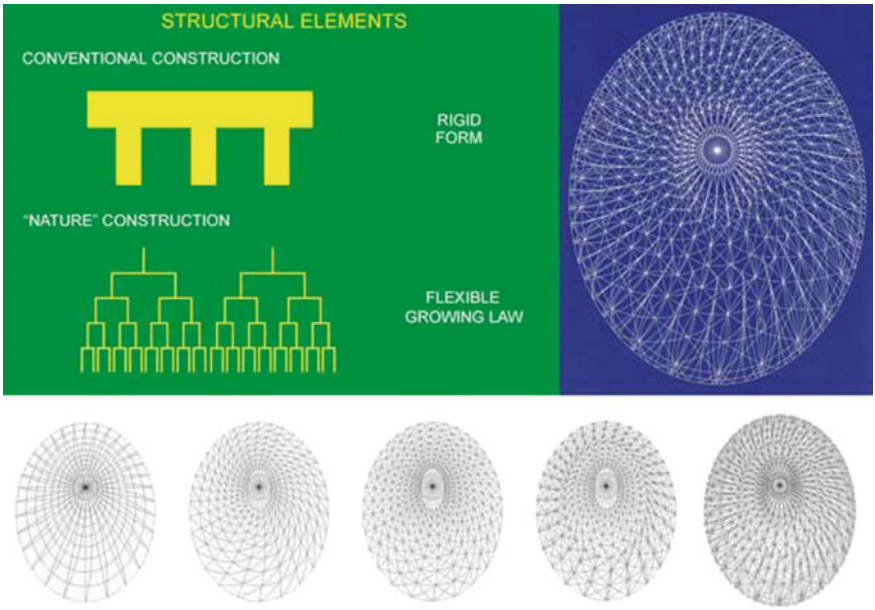

Fig. 10 Comparison between conventional and natural construction (*source* Cervera and Pioz 2010)

(Fig. 10). Moreover, if the load increases, then the number of elements increase but not its dimension; in fact, sometimes its dimension can even decrease. So Nature is more fruitful and efficient in supporting increasingly heavier loads and in saving materials. This is made possible thanks to the cooperation of all its elements.

Man-made designs use a few but huge elements. Instead, Nature uses many, small and micro-structured elements—it avoids big gestures. Moreover, Nature uses flexible growing patterns that enable its structure to adapt to unpredictable circumstances. We build with rigid forms and patterns.

So the hyper-structure starts from a collaborative system of multiple elements and is supported by a development of fractal geometry, as Nature does. Thus, that structure springs from an elliptical base of variable dimensions, which reaches its maximum size at 210 m by 169 m, and is organised in a series of concentric rings, three interiors and one exterior, consisting of "column-streets." These "column-streets" are designed with the concept of emptiness (Fig. 11), that is, not massive but structured in their interior so that they are designed as folded sheets of high-performance concrete. This increases the stability and strength at the same time as decreasing weight.

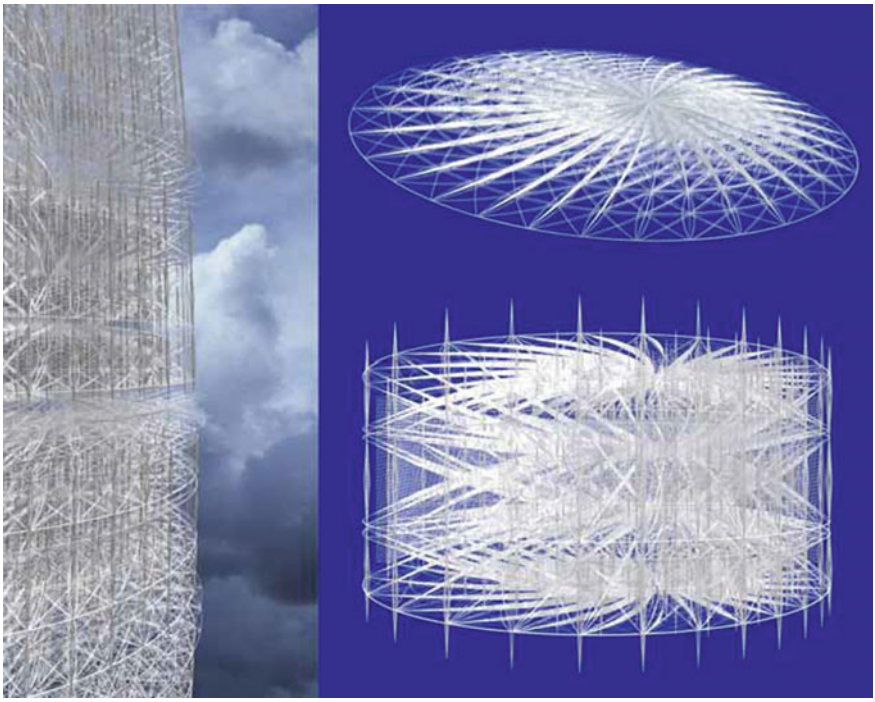

Fig. 11 Hyper-structure: system of multiple elements supported by a development of fractal geometry (*source* Cervera and Pioz 2010)

The "column-streets" are the "highways" of communication of the complex, through which the vast network of elevators, communications and facilities circulate (Fig. 11). In fact, they have a role very similar to that of roads and streets in a horizontal development of the city in that they form the system of primary infrastructure.

One of the main innovations, as compared to the usual prototypes of skyscrapers, is the dissolution of the rigid structural reinforced concrete cores in the three inner crowns of "column-streets" plus the outer resistant "ring-skin". From there, and to guarantee the cooperation of the primary structural rings, it was necessary to generate a structural fabric that weaves the whole system. Fractal geometry, with a simple law and able to multiply as required by the efforts to bear, was the support for building a "structural whole", set out as a large lightweight, flexible, able to withstand deformations, and at the same time extremely durable and stable three-dimensional mesh. This three-dimensional mesh is reflected in both the horizontal trace and the vertical section, so that a series of linear elements of

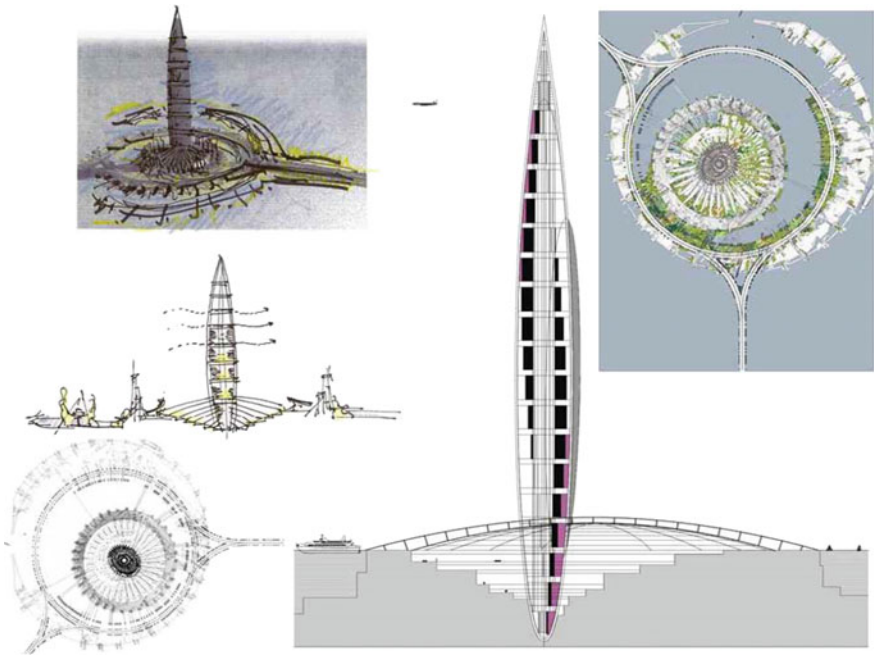

Fig. 12 The Tower is rooted in the soil through numerous micro-structured "filaments" (*source* Cervera and Pioz 2000)

moderate scale generate the structures of the different vertical bodies, that we call neighbourhoods, forming "domes" and "inverted domes" that together, in pairs, open the space in the inner part generating, in addition, the resistant fabric of the peripheral "ring-skin". Several groups of these domes, which in no case are massive but "wired", shape the vertical neighbourhood.

The structure is entirely symmetrical from the elliptical plan of the horizontal variable section; however, the building does not fill up the entire area, since one of the main proposals of this project is to build a city and not just a building. This will provide different ways of occupying the structure ensuring maximum penetration of natural light and air to the inner spaces. In addition, the rings of cities rotate and move vertically in every neighbourhood so that if the structure is fully symmetrical, buildings are not.

The organisation of the Vertical City in vertical "neighbourhoods" (Fig. 12), independent one of each other allows the existence of urban areas in which the gardens have a particular role. The gardens allow the users to enjoy spaces similar to those in a traditional city of horizontal development. The base of these public

spaces and gardens in a spongy built tissue and the quality of the structure that allows their existence be what makes this project not a building but a city.

The project for a Bionic Vertical City/Tower is complemented by a complex of horizontal developments at the base of it that completes the gross built area. The first ring of about 400 meters in diameter is an essential part of the whole as it is a necessary structural base and part of the foundation. The big loads supported by the base of the Vertical City makes the traditional stakes or slab foundation systems not viable. One of the greatest concerns has been the behaviour of the proposed Vertical Garden City against seismic activity. To combat seismic activity, the choice was made to extend the area of the foundation clearly outside the area of the base. From there, and once again supported by the fractal geometry, a multiple structure binds the tower at various levels forming huge "bicycle wheels" where the Bio-Structure is suspended, similar to how trees float in a nest of roots. Thus, the Tower is anchored in the soil through numerous micro-structured "filaments" that become hallways and corridors of interconnection among different areas and levels of the tower.

Concentric with the first ring there is an outer ring, the size of which will be determined by environmental or site conditions, and that will act as a major interchange and communications services between the tower and the rest of the city or territory. Between the two rings, an artificial lake is inserted, with a role to complete the mechanism of anti-seismic foundation further. That is formed by the combination of water and thin membranes, with a fractal organisation similar to the internal structure of crystals. This mixed structure has an excellent ability to absorb vibrations and to convert energy and it is a guarantee of dissipation of loads transmitted by effects of the quake (Cervera and Pioz 2004; Cervera et al. 2003; Cervera and Pioz 2000; Romano 2004).

A Self-sufficient Bio-city

The challenge of this practice-based research is to make a completely sustainable Vertical City (Figs. 13 and 14). This was achieved precisely because of the tower's size. The main strategies to reach the design solution include:

1. Because the natural temperature gradient decreases 1 degree each 100 m, it allows the production of noticeable air movement. We can increase that movement by warming up the air at the base using solar cells. We can provoke air forced movement all along the central core, and using a turbine we can produce up to 20 MW—or energy for approximately 50,000 inhabitants.

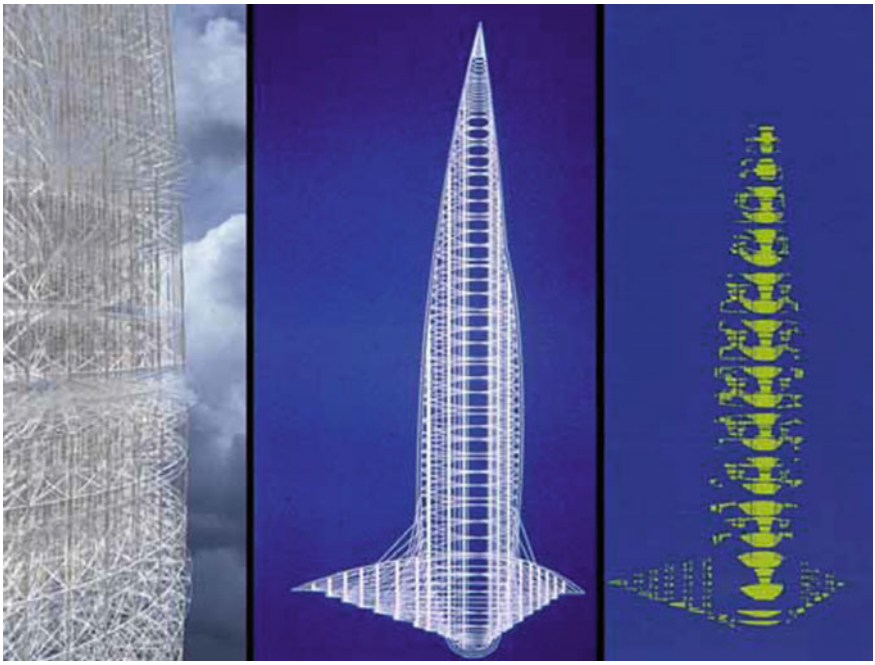

Fig. 13 Vertical layout of the Bionic City: Facade, Section, Green Vertical Map (*source* Cervera and Pioz 2000)

2. The last 700 ft at the top of the tower is a centre for energy production that has windmills and solar and photovoltaic cells.
3. There is also a bio-factory of seaweed or micro-algae, which produces biofuel and reduces CO_2—thanks to the micro-algae needing CO_2 for growing. This is a ground-breaking piece of avant-garde technology in which we are presently involved, after being awarded together with other Spanish companies a four year and 20 million euros subsidised research project. The project is the Cenit Vida Project, BIOCAS (Bioself Sufficient City), Ministry of Industry, Spain, 2010.
4. Water is collected, as much as possible, from rain and a processing plant is being considered. We have ensured there are a steady flow and reserve of water to support the needs of life in the city by building an artificial well on the ground floor of each neighbourhood.
5. These large pools are fed by rainwater, which is collected and then stored there; it is used on demand and sufficiently provides for household needs. It also used for providing reliable resources to the Fire Brigade and for watering green zones.

Fig. 14 The organisation of the Vertical City in vertical "neighbourhoods" (*source* Cervera and Pioz 2000)

6. Finally, we have also included a whole neighbourhood dedicated to providing food for the City thus minimising food miles.

In conclusion, the goal was to design a fully self-sufficient Vertical City and achieve a zero balance (energy consumption/recycling zero balance). The sustainable Bionic Vertical City is a new interpretation of the joint role that architecture and urbanism should play in the formulation of an eco-habitat, which is the balance between Nature and technology—a deep interest that is opening the door to progress without closing the window to our origins or our environment—an environment that, as we have demonstrated here, is also a fascinating world of high (bio) technology (Fig. 15).

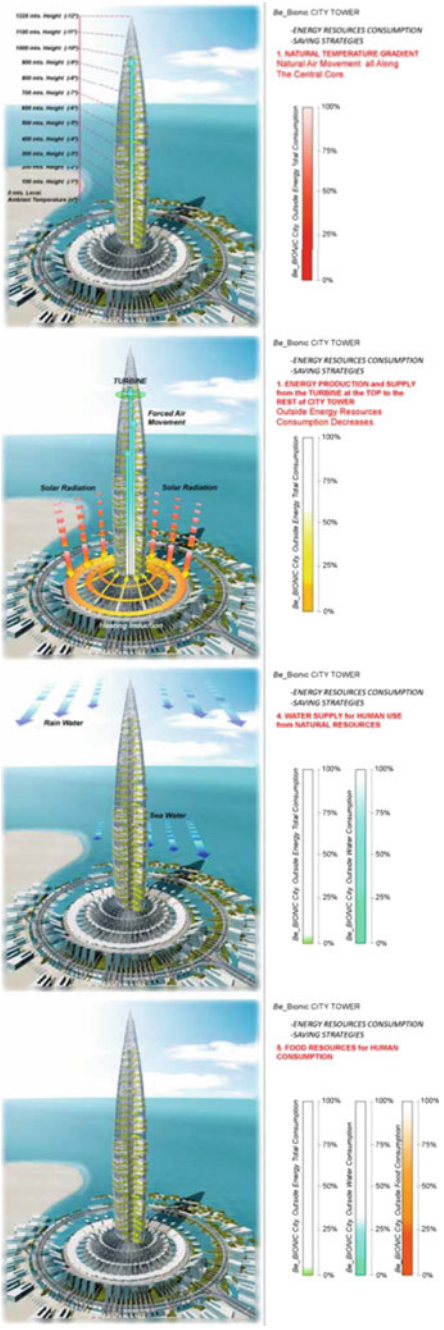

Fig. 15 Main strategies in the Self-sufficient City (Copyrights of all images and projects belong to Cervera & Pioz Architects 2000)

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A Search for Genuine Regionalism: A Regenerative Agenda for the Peripheries

Vilmos Katona

Abstract Considered to be the answer to the problem of globalisation, the "architecture of resistance" was exposited by Frampton (The anti-aesthetic: essays on postmodern culture. Bay Press, Port Townsend, pp. 16–30, 1983) in his polemical essay of the Six points, and illustrated through practice by some architects. The power and degree of the architectural 'resistance', though, was restrained by its rather aesthetic focus. As Moore (Constructing a new agenda: architectural theory 1993–2009. Princeton Architectural Press, New York, pp. 365–384, 2007) points out Frampton's modern regionalism was not based on a political perspective, but on a concept that stressed summarising the history of architecture from an individual aspect, rather than declaring a new agenda for praxis. In his non-modern manifesto Moore (Constructing a new agenda: architectural theory 1993–2009. Princeton Architectural Press, New York, pp. 365–384, 2007) claims the necessity of the production of a regenerative architecture, instead of basing academic considerations on design, will participate in the construction of integrated cultural and ecological processes by magnifying local labour and constructing the technologies of everyday life. Regeneration has an impact on solving the economic trauma in today's peripheral societies by motivating the centre to reconsider its role about natural sources of sustainability. Subsequently, we cannot reject the idea expounded by Solà-Morales (Differences: topographies of contemporary architecture. MIT Press, Cambridge, pp. 57–72, 1987), of the possibility of a new life springing from half-abandoned or marginal areas. What is the unique architectural self-reference that is still untouched by reproducible technologies and global political interventions? To respond to this question, this chapter takes a closer look at the latest relevant tendencies of the architecture of the 'Marginal Worlds'.

Keywords Critical regionalism · Genuine regionalism · Regenerative architecture · Terrain vague · Architectural identity · Local technology

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Introduction

For many years, we have shared the common desire to understand architecture as something capable of reuniting place and technology, and tradition and innovation. Warned by the adverse effects of the globalised world, we have spent decades contemplating the problems arising from the loss of architectural memory, and lamenting any effective countervailing forces. During the relatively balanced years when critical regionalism first appeared, the emphasis of the theory was on how to save our heritage without restricting the power of the avant-garde. Both the traditional ways of building and the innovative impetus were in danger; however, our resources seemed to be abundant. All the academic discussions about a return to an industrialised society depicted a rather romantic dreamscape, which was illusory, but forgivable during an epoch of economic upheaval. Today we realise that the Earth's resources are not inexhaustible; natural and manmade disasters are monumental in their magnitude, and the values that propelled the Industrial Revolution are today held in wide disrepute. The latest world economic crisis has found us unprepared. The first reason for this lack of being prepared is the long-term isolation of the West from the Eastern countries.

When Harris (1958) spoke about the oppositions between centres and margins, he noted the liberal context of California initiatives within the more strict national regulations of the United States, and may not have foreseen that his 'microcosmic' intention could be a model applied on a wider scale at a later time. After the fall of the Iron Curtain, in a politically and ideologically divided Europe in 1990, the Eastern Bloc suddenly joined the Western economic system and embraced it wholeheartedly. From an Eastern point of view, the capitalisation of these European countries made them the national peripheries of the liberating, global West. What liberalism meant to Harris (1958) in North America is now taken as national conservatism in Eastern Europe. The West appeared as the political centre, as well as a united market for free trade. Impoverished countries celebrated their freedom offered by the regime change, but soon recognised their new financial dependence. Confusion grew with the Western world opening its gates, resulting in a disorientation of politics. The new margins of the globalised world could not decide whether they should resist assimilation or accept it, mostly because of the communication twist that has inverted the meanings of liberalism and nationalism (Vais 2008). It remains pertinent today whether the global model represents a centralised or multi-centred one, or hierarchical or cooperative relation between the associated countries (Čeferin 2008: 54). There did not seem to be enough time to bridge divergent points of view, and to arrive at solutions through mutual participation.

With China and the Eastern developing states opting for the world economic 'interface' at an accelerated speed, globalism had spread over most of the Northern Hemisphere; but several Southern countries of the Third World have chosen to follow a growing process as well, which was formerly called 'western type'. After North America's question on the unity of its states and the dissolution of Europe's political schism, we are focusing on the third level of the centre/margin paradigm,

which is the north-south relation. Geometrically, it is the final and the largest shift. What mostly distinguishes the two hemispheres is that the political, demographical and economic stability of the North is relatively higher, while the South has embraced less a 'common will'. Thus, it appears to be globally more chaotic but locally more fundamental. These parts of the world know how to survive better in moments of disaster and poverty. They do not know the meaning of consumerism for they cannot afford wastage. Apparently, they would be less sensitive to a future cataclysm than the North with its shield of unity broken. It is time to learn from them.

It would be a mistake, though, to consider the North as perfectly globalised, for there are still parts that are uninfluenced. The spirit of traditions, for example, is avoided by the global policy which leaves every value out of consideration that qualitatively eclipses the level of materiality. It is mostly the consequence of the rapidity of the period for which it has no time to attain full growth. These policies only affect what can be grasped easily: the quantitative and the statistical (Guénon 1945). For this reason, we turn to the quantitatively modest but qualitatively advanced to find examples for regeneration.

Features of Local Regeneration: Non-modern and Non-aesthetic

International modernism could have been considered as an attempt to develop an architectural language to exchange local experiences, but it has rather acted as a policy for the neutralisation of identities. In the history of modern architecture, we find its roots in the work of CIAM, especially in its pre-war congresses. Looking back in time, we can re-evaluate this period on the one hand as a sincere wish to spread social equality by solving the lack of habitable residences throughout the world, but on the contrary as a dramatic tendency that theoretically uniformised human beings. The Athens Charter, along with Le Corbusier's aggressive rhetoric for a mechanised architecture (Jeanneret 1923, 1957), clearly suggests that the city should functionally satisfy the minimal needs of people and that the products of the dynamically evolving technology should likewise appeal to their tastes. The Charter describes well how every city should look, based on the physical parameters of an average person. This implies the negligibility of both the contextual differences between the places where the cities are planted and the personal differences between the cultural identities, lifestyles, abilities or the temperament of the people who live there. The CIAM connected international modernism to uniformity.

This is the main reason why we encourage a non-modern approach to regionalism. It is time to focus on the real, instead of the statistical, human being that is Aristotle's zoon politikon. 'Politikon' refers to the self-consciousness, the teleological character of a man, and the organised state or society as the background for human life. The Greek phrase also implies humanity's freedom to designate and

arrange its place for living. Without this freedom, there is nothing that differentiates human beings from the rest of the animal kingdom. Therefore, the ability to create a place for dwelling in a society is an essential premise, which makes us uniquely human. Human beings build, not only for themselves as individuals but, for many in society. This relates closely to Heidegger's (1951) ontological explanation on the unity of building, dwelling and thinking.

Humanity distinguishes itself by creating, and not by merely choosing aesthetically from pieces that are already given. As Frascari (1984: 500) explains, constructing (logos of techné) is in a 'chiastic' relation with construing (techné of logos). By putting structural pieces of the building together, the architect construes their design. No plan can be implemented without the feedback of its construction, the materials, and the place, which always compromise the general concept. Without this interference, architecture becomes a self-referential play, leading to dissimulation. The 'chiastic' relation also sheds light on the secret of creation. The process cannot be fully controlled by man. Thus, the experience of the construction by doing reveals how ephemeral human efforts are. Still, the building astonishes the architect by being plausible at the end. Only local labour can recognise the immanence that connects human effort to a higher intelligibility. This is why local workforces are so essential to understanding regeneration. The source of the power which builds up the house is somewhere between matter and plan. To understand this, the architect needs to work together with the labourers: the masons, the joiners, the carpenters and so on. These labourers need to feel the resistance of materials as well as the lightness of a perfect joint. From element to element, all pieces have their role in the whole, as all the labourers contribute to the working community. During the months of a well-organised construction, the collective consciousness of the labourers evolves to work more efficiently and to be more sparing of resources. Their community turns into a local identity that is the origin of the story of the building. This is one way how architecture regenerates work power and identity without any aesthetic argumentations before the work of art.

The other reason why a regenerative architecture should take aesthetics as secondary is included in Moore's manifesto. Moore (2007: 377–378) argues the primordial premise for regional thinking is not the academic dispute as to what the building should look like, but the political will which encourages people to use their natural skills and local resources freely. Because of the bureaucracy which makes it illegal to work out direct solutions without first going through the red tape of seeking permissions, architects refuse to coordinate the construction on site. Decisions are divided between a central office for construction law and the actual planning team, which is taken as the legal periphery of the former. It is no wonder that the natural beauty of the local building is also understood as secondary to former aesthetic priorities. As a result of centralisation, today's interest in aesthetics substitute or mask politics in architecture. Both the modern uniformisation and the aesthetic prioritisation object to the direct experience of architecture, which is the key to regenerating local identities. Therefore, a genuine regionalism is nonmodern and non-aesthetic.

Essential and Real

The subject of phenomenology is the essence of objects, either conceptual or real. Motivated by the wish to understand the entia rationis[1] of the building, the only phenomenology can approach architecture close enough to touch its essence. This is traditionally done by contemplation, which prepares the intellect to catch the central meaning intuitively. What intuition finds is not a definition referring to other objects or final axioms, but the a priori truth revealing itself in the most immediate way. Instead of encouraging random associations, phenomenology guides us in seeking the a priori core of architecture that is certain, inevitable and the most intelligible.

As illuminated by Hildebrand (1976: 63–138), the absolute confidence of a priori knowledge is not something transcendental and unreachable for mortals. On the contrary, its intelligibility makes it available to everyone. The truth revealed by contemplating the essence of architecture is explicit in simple judgements like good/bad, harmonic/disharmonic, useful/useless, original/reproduced, and so forth. It also appears in simple statements about the structures, the textures or other characteristic elements of the building. None of these declarations will be self-referential or tautological, to the a priori truth does not lie in the repetition of basic attributes but the recognition of an essential nexus between two independent objects. The phenomenological truth is always synthetic as a joint.

Many of these syntheses can be found in symbolic statements about the building. If, for example, when looking at a rafter of a wooden roof, we state that "the softest contacts between structural elements are as perfect as a geometrical cut" (Frampton 1990: 522), after which we recognise that "any geometrical cuts are too perfect to be tangible" than an a priori truth is revealed to us about materiality: namely, that imperfection and tangibility are premises of material reality. If it is so simple, why is it a priori? It is because our statement was made after remembering the essence of geometry and matter without making any conclusions, or evocations of prior experiences. The most important fact is that the statement was initiated by contemplation about a particular architectural structure available for everyone, without which the truth about it may not have been revealed. This well illustrates that essential truth is not necessarily transcendental, but lies in the physical reality as well. We do not have to design monumental Platonic solids for allegorising truth, for it is enough to start building a shed in a contemplative spirit.

The closer we get to the subject of architecture, the deeper contemplation is needed. As we have just seen, this is not done by theory but by making in the real world. Consequently, the search for the essence of architecture is the most practical approach of which we can speak. As contemplation is done on site, the local building is an adequate way to start an intimate relation with architecture's phenomenological subject. The subject and the essence of architecture are revealed by the reality of an intimate local labour. The local building is the core unit of regional

[1]Entia rationis, in metaphysical world, is only rational and exist in mental world and thought to exist in mind only but doesn't exist in real (Bunnin and Yu 2004: 211).

architecture, which only differs from the former in scale. Genuine regionalism depends upon local labour with the stamina to reveal the essence of architecture, which is present in the practical reality of building. Genuine regionalism is both essential and real.

Adaptive and Resistant

Genuine regionalism does not mean a new protocol for architecture. The six points for the 'architecture of resistance' presented by Frampton (1983) are secondary to the political background. This makes them implementable by encouraging local labour, the use of local resources, and regional planning. Frampton's affection for the tectonic is not based on a phenomenological certainty, but on the viewpoint of a carpenter. The will to find an architectural attitude that is capable of resisting the confrontations with the interest in globalisation allows a much more colourful palette of solutions than the tectonic. As it was explained by Katona (2010), even the actual meaning of tekton implies the freedom to fabricate textures not necessarily following the logic of the load-bearing structure. It is evident that primitive cultures which carve their homes out of porous cliffs, or others who erect thick whitewashed walls against the heat, do not build according to the tectonic, but rather to the stereotomic system. This fact does not discourage them from forming local communities and building in their traditional way. Of course, if they ran out of clay, some of them would search for another place to live or call other people to teach them how to build differently. A genuine regionalism adapts to the changing local conditions.

Regions look back on their history of technological evolution according to the altering needs and circumstances of the place. Adaption to the local facilities, though, does not mean a compromise against uniformised technology, which restricts the rich possibilities of regeneration by expelling the one offered by the place. It is cardinal, therefore, to make a strict distinction between uniform and sui generis (*defines as 'of its own kind'*) technologies. Regionalism cannot and does not need to resist technology, but it can counteract uniformisation with its technological development as exemplified in the case of some contemporary manufacturers.

Moore disapproves critical regionalism because of its being too permissive towards modern academism. Moore's regionalist exhortation still suffers from a compromise between the irreproducible and the uniform, as is readily demonstrated in his cross diagram (Moore 2007: 374). Place and technology determine the two perpendicular axes in Moore's diagram (Fig. 1) and divide the plane into one field with double positive coordinates, another with double negative coordinates, and two other fields with mixed coordinates similarly to coordinate geometry.

The system was prepared by placing all the aspirations of contemporary architecture into one diagram. From the diagram, it can be seen that Moore determines place and technology as separate, independent criteria with no influence on each other. 'Orthodox' modernism is positioned in the field (−;+) while postmodernism

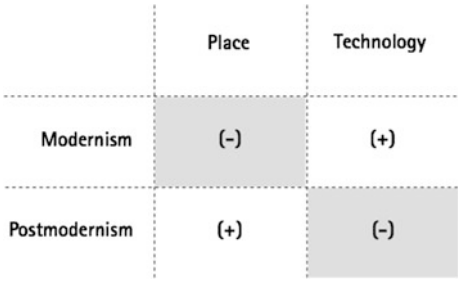

Fig. 1 The value opposition of place and technology in modern thought (Moore 2001: 135)

is placed in the field (+;−). Taking this simply, it means that according to Moore, modernism works against place but for technology, while postmodernism works for place but against the determination of technology. Accordingly, critical regionalism can be found in the field (+;+), and while an antagonist of it, 'radical nihilism' is placed in (−;−). From this formula, it can be clearly seen that critical regionalism is positive both regarding place and technology. These features make critical regionalism analogous with its intention to respect tradition and reform power at the same time. Nevertheless, there is a problem with this concept, for an anomaly reveals the most obvious contradiction of this double will.

Is technology significant enough in itself to be considered as a factor independent of place? If we could find a technology independent from the place, it can be none but a universal technology, which is the same under any conditions. However, can we talk about any universal building technologies reproduced independently from local resources, needs and tradition? We can do so only regarding the general outcome of the construction industry—the result of modernism's international achievements from a historical point of view—and recently of the market of uniform industrial products (Katona 2012: 150–153). The diagram's 'technology' represents globalism as a consequence.

Moore fails to distinguish sui generis from uniform technology. This omission exposes critical regionalism because it shows that critical regionalism makes a compromise between the local and the globalised. Therefore, we need to reinvest critical regionalism with the 'architecture of resistance'. This can be achieved by genuine regionalism which adapts to the alterations of local conditions, but is resistant to the uniform. Genuine regionalism does not provide architecture with design protocols but is founded on sui generis technology.

Genuine Regionalism

The following examples will demonstrate some of the features of genuine regionalism. These examples were not found because of an aesthetic preconception about what architecture and regional design should be, but have been chosen because they derive from an irresistible call for a phenomenon that has lost our attention. That is

to say; the examples antedated the recognition of the tendency behind them. We emphasise that the listed examples be only a few of the many unknown. Our global communication facilities made it possible to access them through the works of prestigious designers, some due to being mentioned here, but their effort, in fact, targets the nameless.

Need and Limits

In his essay about weak architecture, Solà-Morales (1987) illustrates that there is always a chance for rebuilding even if there are no examples of how it should be done. What Solà-Morales speaks about is the hidden reserve of vacuity that is present in wastelands, drosscapes (Berger 2006), or fields hit by disasters. Until these territories are reutilized (erased/replanted) for the global economic interest, they appear infertile, marginal and in-between. What is of interest here is how they are excluded from space, and fall out of time. Still, they do not disappear by being prescribed by these domains. On the contrary, we can experience them in a more meaningful way. Compared to wastelands or drosscapes, the life of operating cities appears to be partial, and finite. One could spend days in a deserted factory yard or an abandoned village without seeing movement or activity. Although the colours, the patterns or the contours may differ, the calmness of these places is the same everywhere. It is adequate to say that this phenomenon of wastelands is both more pervasive and virile than the delicate, even fragile, political equilibrium maintained by globalised architecture

The evaluation of aesthetics as a fixed point for regeneration in an age losing its orientations by Solà-Morales (1987) is to be doubted. Aesthetics helps to identify a community or a region, but aesthetic value depends on the restoration of the common will to build and the freedom to use local resources. Where vacuity enters into human thought, need appears and wants to be fulfilled in the most direct way. It is what makes terrain vague, immediate and pervasive. These qualities of terrain vague make it informal and serve to identify it and evoke regeneration. Accordingly, we take the vacuity of 'Marginal Worlds' (Heidegger 1969) as the primordial source of regenerative architecture.

The peripheral fields' quasi-space is avoided by global interest because it is not a potential market for the production of uniform products. A regenerative strategy, therefore, will be kept intact by globalism until it starts to sell talent, as a trademark (Čeferin 2008: 51). As soon as local technology promotes itself as 'the alternative', it exchanges its natural character for an aesthetic one. This is the way it loses its flexibility and freezes evolution, thus becoming unaccommodating to the challenges of the alternating local conditions. A local architecture of this kind soon segregates itself from the building community and becomes formal instead of being essential. By giving up its limited nature, it will lose contact with local needs.

The workshops of Martin Rauch operating in Schlins and several other villages in the Vorarlberg region of Austria are examples of this (Kapfinger 2003). Rauch

Fig. 2 Funeral Chapel in Batschuns, Austria, designed by Stefan and Bernhard Marte, 2002 (*source* http://szakralis.wordpress.com, re-accessed on 25 February 2016)

made the plans for the rammed earth walls of a funeral chapel in Batschuns 2002 designed by Stefan and Bernhard Marte (Fig. 2).

The project revitalised the building community by getting people to take part in the construction. Rauch taught villagers to build from local soil, getting them involved in the process of erecting walls layer by layer (Anon 2006). They used a unique moulding technology that was inspired by the local mud houses. The foundation of the chapel was a popular decision of the village using the empty land of the expanding cemetery. The site's attributes yielded the regeneration of the location towards an indigenous architecture. The exportation of the technology to the Berlin Wall Reconciliation Chapel (2002) of Rudolf Reitermann and Peter Sassenroth had not reached the same success before. Reasonable efforts were made to integrate the design into the history of Berlin soil (by mingling ruin ashes to the building mud) (Welzbacher 2001), but the construction could not exceed a symbolic level. While it became contextually narrative, the building's presence remained rather virtual.

The same thing has happened to many contemporary attempts to recover architectural authenticity. What we prefer to search for is at the margins of the globalised world. Most obviously we can find such places in the regions of famine, poverty and overpopulation. Examples appear in some parts of Africa where Hollmén Reuter Sandman Architects designed social complexes for African women and children in need. The Finnish team studied the life of local people and involved them in the building process. Their credits include the ongoing TunaHAKI Centre orphanage project in Moshi, Tanzania (HRS 2007), and the Rufisque Women's

Fig. 3 Women's Centre in Rufisque, Senegal, designed by Hollmén Reuter Sandman Architects 2001 (*source* http://www.hollmenreutersandman.com, re-accessed on 25 February 2016)

Centre, 2001 (Fig. 3), which integrate both the local brevity and simplicity of design and the traditional village planning of the place.

By applying a fenced, square-type ground plan with an encompassed open air space in the centre, Hollmén Reuter Sandman Architects went back to the urban structure of the Ukumbis (Hollmén et al. 2005). Along with this, they posted a message to the community by opening a new village centre for the people living in the peripheries of the local society. As a sign of respect and new hope, they painted the walls of the cubic-shaped complex with a distinctive red colour, which advertises the accomplishment of the building—a fact that rarely happens in the Senegal suburbs for the inhabitants fear of high taxes. On the contrary, people here finished the construction with joy, recycling even their used glasses to make translucent patterns on the façades. The revitalisation of the Senegalese city of Rufisque's peripheries sprung from the need of the locals was built from very limited sources. The ambition that it should make the nucleus of a sustainable community emerged outside profit-oriented politics or aesthetic considerations. It does not mean, however, undermine the beauties of such urban or individual plans, for we define beauty as the expression of the essence of building (Heidegger 1935). That expression is always vital for its high potency to reveal the truth behind the work of construction.

Culture and (In)dependence

In cases of a disaster or socio-economic collapse, can vacuity enter into human space? The larger its power, the more embracing a response it generates. Regarding observations presented here, the intensity of destruction is proportional to the

cultural depth of regeneration. As soon as a region arrives at a point of cataclysm, cultural memory is called upon in a search for solutions. This is the consequence of the lack of material values, which turns people's attention to sufficient knowledge. The stress of need generates communities, new social hierarchies, immediate action, and the recollection of knowledge that was latent. When it is a question of survival, construction becomes a collective mission to which all the members of a locally organised community will contribute according to their skills.

The's 20K housing project is an example of the application of simple, but effective, architectural knowledge. It results in variations of light structure houses for residents who have a steady, low or modest income, and yet are unable to obtain adequate housing through conventional financing in the United States. These houses, which take local circumstances into account, are affordable and easy to build. The research team in the studio tests housing modules to develop small dimension urban formations as well (Mays 2007). Their projects welcomed students willing to take part in experimental programmes, who subsequently contributed to the establishment of communal buildings like clubhouses, museums and fire stations (Fig. 4). By forming independent building companies, they proved effective in overcoming the apathy and inertia that characterised central politics.

One year after Hurricane Katrina's strike in 2005, the devastated zone of New Orleans was still under water. Both federal and state governments failed to organise the recovery in time, and the insurance companies refused to compensate the victims of flooding and wind-driven water. This resulted in mass emigration, crime and disease. The opposite happened in the Central Pannonia region of Hungary where a dam collapse of the Ajka aluminium factory's settling pool poured a lake of alkaline sludge on Kolontár and the nearby Devecser in October 2010. After immediate

Fig. 4 Safe House Museum in Greensboro, AL, designed by The Rural Studio, 2010 (*source* http://www.ruralstudio.org/projects/safe-house-museum, re-accessed on 7 March 2016)

humanitarian aid, central efforts were made to modify customary building laws to shorten reconstruction time. As a result, the new housing districts opened their gates only eight months after the catastrophe (Bechtold 2011). The building project was directly entrusted to Imre Makovecz's KKE Fellowship, whose purpose was to design more livable homes and to improve local communities. By maintaining constant communication, the team was highly successful in satisfying the communities' needs. Imre Makovecz's KKE Fellowship spent most of their time on the site together with the affected villagers, commiserating with them while giving them hope for the regeneration of their homes and communities.

Compared to the case of the 20K project, the recovery in Hungary was more centrally orchestrated, and as a result, much more dependent upon central efforts. While in the case of Hurricane Katrina, central and local politics were in an adversarial relationship, the Ajka aluminium factory disaster relief work was cooperative. The cooperative relationship in the latter worked against the critical factor of regeneration, as it stimulated cultural formalism. Central politics used the excellent power of regeneration to promote and strengthen its position through architectural reminiscences of history. While the organisation of the reconstruction following the disaster eventually evolved into something that proved to be efficient and realistic, the architectural solution was superficial, for it had lost its direct relation with the essence of regeneration. The possibility of a local cultural renewal through living architectural memory was overtaken by the central political message; thus, the region quickly lost its privilege of being peripheral.

A true cultural revitalization happened in Japan after the Fukushima disaster in 2011. Among many other parallel experimental efforts (Taro et al. 2012), Kengo Kuma's office developed temporary objects of use such as paper tents that were easy to fold and unfold anywhere, but Kuma's most realistic intervention was methodological. His East Japan Project was launched to root out traditional craftsmen near the damaged zone (EJP 2011). In Sendai and other parts of the Tohoku Region, they found the last craftsmen of sewing, texturing and basketry, and encouraged them to make products for the Fukushima reconstruction. With a team of architects and designers, they started to work together and exchange traditional craft knowledge with contemporary experiences. By the same effort, they gained technical inspiration from tradition and saved a dying local culture. Since then, they have been running a workshop for scholars of both design and manufacture to maintain this practice experience. The twofold nature of mutual participation made EJP genuine and realistic, showing the interdependence and real cultural depth of regional regeneration.

Conclusions and Recommendation

Local regeneration is the origin of genuine regionalism. It focuses on the real, instead of the statistical, human being, who has the freedom to designate his place of living and build from the local cultural and material sources that the chosen place

offers. Genuine regionalism cannot afford wastage; therefore, it turns to the quantitatively modest but qualitatively advanced. During a regenerative construction, labourers from communities to improve their consciousness in working efficiently and with sparing resources. They use architecture to reclaim work power and identity without aesthetic prioritisation predetermining the work of art. Instead of encouraging random associations about architecture, the regenerative agenda is radical in seeking the a priori core of building that is certain, inevitable and the most intelligible. It targets the subject and the essence of architecture which is revealed by the reality of an intimate local labour. Genuine regionalism has the power to adapt to the local conditions of any appropriate place, and to resist the compromise towards uniform technology. Instead, it encourages the continuation and the invention of local technologies.

Sites of terrain vague that appears after natural or socio-economic collapse provide the opportunity to identify and evoke regeneration. Accordingly, we understand the vacuity of 'Marginal Worlds' as the primordial source by which we can access the vital expression of the essence of building (i.e. beauty). The cultural depth of regeneration is determined by the degree of interdependence and the effectiveness of local politics. In the following points we summarise the general features of genuine regionalism as a recommendation for the peripheries having the unique chance to show alternatives to the globalised world by natural recovery:

- Genuine regionalism is nonmodern and non-aesthetic. Both the modern uniformisation and the aesthetic classification of objects is secondary to the direct experience of architecture, which is the key to regenerating local identities.
- Genuine regionalism is both essential and real. Genuine regionalism depends upon local labour with the stamina to reveal the essence of architecture, present in the practical reality of building.
- Genuine regionalism adapts to the changes in local conditions but is resistant against uniformity. It does not provide architecture with design protocols but is founded on sui generis technology.

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