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CREATION OF NEW KNOWLEDGE

DIALOGUES INSIDE AND BETWEEN DISCIPLINES

Editors: Anne Elisabeth Toft and Magnus Rönn

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NAAR

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Anne Elisabeth Toft and Magnus Rönn

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FOREWORD

Anne Elisabeth Toft and Magnus Rönn

The Nordic Association of Architectural Research (NAF/NAAR) is an independent association of architectural researchers from universities and schools of architecture in the Nordic countries. It has existed since 1987.

NAF/NAAR critically engages in discussing research and the production of architectural knowledge as evolving practices. It aims to raise questions and challenge assumptions. And it wishes to track histories and pursue new tendencies within the architectural discipline or profession.

Creating encounters, interactions, and dialogue between peers has always been central to the association. Its primary function is to facilitate the research collaborations of its members and their exchange and dissemination of research results. Through its research symposia and peer-reviewed scientific journal *NJAR*, the association sets a standard for the scientific and artistic level of architectural research produced in the Nordic countries.

The present book is the proceedings publication from the 2023 NAF/NAAR symposium titled *Creation of New Knowledge: Dialogues Inside and Between Disciplines*.

This symposium—aimed at PhD students—was organized in collaboration with the PhD school at the Royal Danish Academy in Copenhagen, Denmark, which also hosted the event on 28–29 September 2023. The symposium attracted participants from all the Nordic countries. With its focus on transdisciplinarity, it brought together students who represent different academic disciplines and/or students who work across disciplines in their research, and whose PhD projects are therefore also characterized by this.

The proceedings publication consists of articles that went through peer review. All the articles in this publication—apart from those by the invited keynote speakers—were thus submitted to a double-blind peer review process conducted by NAF/NAAR.

Keynote speakers who lectured during the symposium included: Tim Anstey, Professor of Architectural History at the Oslo School of Architecture and Design and director of the school's PhD Programme; Albena Yaneva, Professor of Architectural Theory at the Politecnico di Torino and Adjunct Professor at GSAPP, Columbia University; and Saija Hollmén, Professor of Practice in Humanitarian Architecture and head of the Aalto WiTLAB at the Aalto University School of Arts, Design and Architecture.

On behalf of NAF/NAAR, we extend our sincere thanks to all of the many colleagues who kindly contributed to the symposium and/or to the present volume.

Thanks are also expressed to our close collaborators at the PhD school at the Royal Danish Academy in Copenhagen: Associate Professor and head of the PhD School Henrik Oxvig, Associate Professor Anders Hermund, and Research Administration Officer Ditte Dahl for successfully co-organizing the event.

Gratitude goes as well to the many researchers from the Royal Danish Academy and the NAF/NAAR Board who participated as moderators during the symposium, thus qualifying its discussions.

We also extend our heartfelt thanks to the eminent keynote speakers for contributing their particular perspectives on the theme of the symposium.

We are grateful to the individual authors who submitted articles to the publication and to the many peer reviewers who have supported NAF/NAAR and its work by offering their time and professional expertise when reviewing the articles. We would like to express our appreciation to all of these individuals.

Anne Elisabeth Toft
President of NAF/NAAR

Magnus Rönn
Vice-President of NAF/NAAR

INTRODUCTION

Anne Elisabeth Toft and Magnus Rönn

NAF/NAAR has always had an interest in surveying and critically discussing the power systems or regimes that frame and direct the research being carried out in the Nordic countries. As an association of researchers in architecture, it quite naturally focusses on architectural research—including research in landscape architecture, urban planning, and design studies.

PhD research has been addressed in many NAF/NAAR symposium proceedings publications and the discussions in this volume are specifically related to them, most notably to the 2013 volume, *When Architects and Designers Write/Draw/Build/? a PhD*, with its focus on research by design, and the 2018 volume, *The Production of Knowledge in Architecture by PhD Research in the Nordic Countries*.[1] Specific to the latter publication was its interest in pursuing architectural research and the notion of it as a social, cultural, and political construct.

Formalized doctoral programmes in architecture are a fairly recent phenomenon. In Europe—including the Nordic countries—such programmes have only existed since the early 1990s.[2] They were introduced when demands in society led to a need for higher education to be research-based and for educators teaching at the university level to have a PhD degree.[3] This generated a need to include research as an activity in creative fields like design and architecture, thus developing them from fields of practice to fields of inquiry.[4]

By analysing the educational programmes of the PhD schools in the Nordic countries, one can grasp a picture of what constitutes the students' research educations: what courses they are offered, what methods and theories they are taught, and what discourses and practices dominate their learning. The epistemological starting point provided by their education conditions their research and research results. It shapes their understanding and concept of architecture, as well as their understanding of research and what it can be.

Despite the common perception that the educational systems in the Nordic countries are relatively alike—and that there are more similarities than differences behind their ideologies—this legacy is today contested. A closer look at the educational programmes of the PhD schools in Denmark, Norway, Sweden, and Finland that offers PhD degrees in architecture reveals that they are quite different from one another. By building on different academic traditions and pedagogical models, they represent diverse approaches to PhD studies, and to how research should be conducted. Furthermore, their research is based on different funding models, which leads to diverse priorities in a large number of areas. The particular funding model is, for example, decisive in the individual PhD student's choice of research topic.

In a globalized, neoliberal society, there seems to be little common understanding of canon or critical discourse. What defines architecture, its discipline, and the concept of architecture is today widely being questioned or reconceived at universities and schools of architecture. At the same time, there are many other disciplines that have an interest in architecture; disciplines that want to capitalize on it and its practice, to appropriate its name, methods, and theories. Within the educational system, new disciplines formalize while old ones disappear or merge with other disciplines. This is instrumental in changing or expanding the narrative of many traditional disciplines such as architecture. The complex contemporary challenges facing our society are as encompassing and differentiated as those, for example, related to Artificial Intelligence (AI) or the Anthropocene. These challenges also entail crucial redefinitions of the role and responsibility of the architect, leading to novel research interests and methods for researchers in architecture. Without doubt, the architectural profession has always brought many different disciplines together, and architects have always collaborated with peers from other professions. However, due to the radical transformation of the work of architects in recent years, not only the need for transdisciplinary collaboration and interdisciplinary thinking seems to be growing. The definition of the concept of transdisciplinarity and what it entails has also become a decisive issue for the discipline to discuss.

Working beyond bodies of inherited disciplinary knowledge challenges educational institutions and their curricula, also including PhD schools and their programmes. It puts them in what seems to be an epistemological dilemma, since different research cultures and regimes set different standards

for what counts as knowledge and research, based on different methodological approaches and theories. In order to find expression, emerging thoughts and new knowledge must speak in the terms of the established disciplinary discourses, whilst simultaneously breaking away from them and their legacies and norms.

Against this backdrop—and prompted by its collaboration with the PhD School at the Royal Danish Academy in Copenhagen—in 2023, NAF/NAAR decided to look at PhD research in architecture in the Nordic countries through the lens of transdisciplinarity. Understanding architectural studies as a diverse, dynamic, and growing relational field, transdisciplinarity in this context means that many different sciences (anthropology, sociology, geology, et cetera), crafts, and creative arts can be relevant to architecture and its knowledge production depending on the focus of the specific research.[5]

Transdisciplinarity and interdisciplinary thinking inform the curriculum and the pedagogical approach at the PhD School at the Royal Danish Academy. The school offers courses in the fields of architecture, design, and conservation.[6] And students can embark on either a PhD in academic research or a PhD in artistic research.[7] In cooperation with NAF/NAAR, it wished to discuss societal and educational changes and to pursue the intellectual capacities, values, and skills that transdisciplinary studies foster. With the symposium in 2023, NAF/NAAR and the PhD School at the Royal Danish Academy thus aimed to address the multitude and diversity of current research practices, and how the PhD programmes for architectural research in the Nordic countries embrace the notion of transdisciplinarity. The symposium also wanted to illuminate how transdisciplinarity and interdisciplinary thinking shape the production and outcome of PhD research, and to learn how working in transdisciplinary collaborations or with transdisciplinarity *per se* is experienced by PhD students.

To frame the discussions, NAF/NAAR and its collaborating partner invited three international keynote speakers: Tim Anstey, Professor of Architectural History at the Oslo School of Architecture and Design and Director of the school's PhD Programme; Albena Yaneva, Professor of Architectural Theory at the Politecnico di Torino and Adjunct Professor at GSAPP, Columbia University; and Saija Hollmén, Professor of Practice in Humanitarian Architecture and head of the Aalto WiTLAB at the Aalto University School of

Arts, Design and Architecture. As they come from different discursive backgrounds, but are all involved in academia and the management of education and research, each of them reflected on the theme of the symposium from their perspectives.

Discussions during the symposium were structured in three tracks. Under the broader theme of transdisciplinarity, the objective of track one was 'to encourage the doctoral students to reflect on their target group for the PhD project and on how the results are intended to be used'.[8] Track two invited the doctoral students 'to describe and reflect on the transdisciplinary nature of the research problem in their PhD project, exploring how they communicate with other disciplines and understand the contribution of architectural research to society'.[9] Track three focussed on 'how financial and organizational conditions influence PhD projects, the research findings, and how the results are presented'.[10]

Although the collection of texts in this book reflects the discussions in the symposium, the articles are not structured according to the three tracks. Rather, the book has—and this might be regarded as a symptom of the topic discussed in the symposium—a heterogeneous structure organized in two parts: Section I and Section II. The first consists of the articles by the three keynote speakers and the second of articles by PhD students, with a total of nine contributions. By structuring the book in this way, separating the written contributions by keynote speakers and those by PhD students, Section I creates a conceptual framework for Section II.

Not surprisingly, the articles and essays in the publication vary in terms of subject areas, research issues and approaches, as well as theories and methods. And the authors in Section II of this book also interpreted the theme of the Call for Papers for the symposium very differently. Among the written contributions, we see roughly three parallel approaches to reflecting on transdisciplinarity in PhD research. Firstly, we have articles that focus mainly on describing, presenting, and discussing the research issues and the frameworks in the authors' PhD projects. Transdisciplinarity, and the concept of it, are often less apparent in these cases. Instead, reporting on research findings and results is central to the contributions. Secondly, we have articles focussing on research methods and their use in the PhD projects. Here, the relationship to transdisciplinarity appears as an underlying issue, but without

being clearly expressed or discussed. Thirdly, we have articles that actively reflect on transdisciplinarity and thus refer to this key concept in the Call for Papers. These contributions point out different expressions of transdisciplinarity, mainly as a need for a kind of joint venture between architecture and other disciplines so as to cope with multidisciplinary research challenges at hand.

SECTION I

Tim Anstey, architect and historian, has worked with PhD education in Norway for many years. In his article 'Learning Outcomes: Reflections on Ten Years of Engagement with AHO PhDs', he gives a personal account of developments at the PhD School at the Oslo School of Architecture and Design (AHO) and its programme. Today, the school in Oslo has forty active candidates in its PhD programme, which Anstey is responsible for curating. Although it facilitates many different kinds of students, whose educational background may, for instance, be in service design, industrial design, landscape architecture, urban theory, or preservation and circularity in architecture, it offers one single PhD education programme. New students are required to take a number of courses together. But the school aims to provide a structure that allows for the diversity of 'output, apparatus, and process' associated with the various disciplinary areas in which these candidates operate. Carrying out PhD research means qualifying for practice. And since doing a PhD is a learning process, pedagogic models are, in Anstey's opinion, of relevance when PhD students are to be trained as researchers. In his article, Anstey goes on to reflect on teaching and pedagogic models using concepts derived from pedagogic theory. In addition, in his view, the PhD programme and its elements, research, and definitions of research and research formats, as well as meta-systems such as the 'cost-benefit analysis systems' characteristic of late capitalist systems of investment, shape the research environments and the design of PhD Programmes.

In her article, 'Interference in Architecture: On the Art of "Tormented" Writing and the Future of Architectural Research', sociologist Albena Yaneva urges the architectural researcher to 'perfect the art of architectural writing, to invent *a new syntax,* a new grammar, and new compositional principles for writing'. She criticizes the impact of what she calls dominant research cultures in academia, when she advocates for 'a new form of architectural research' and new research methods. For, according to the author, society's

many complex challenges call for a different kind of architectural research than the one offered by critical theory. The research we need, Yaneva argues, is '*an earthly one*'—introducing a 'realistic' research approach to architecture arising from within the field of practice—one that remains at close proximity, and not at a critical distance to its objects of research. What architectural research needs more specifically are 'new methods of enquiry that resonate with parallel developments in diverse fields.' Drawing on the actor-network theory of French sociologist Bruno Latour, Yaneva explains that a new form of research requires an altered mindset on the part of the researcher, who must rethink the context and processes of innovative knowledge production and what it should actually lead to, as well as why and how.

'Dwelling in the "In-Between" of Disciplines', authored by architect Saija Hollmén, offers a discussion of contemporary definitions of interdisciplinarity, as the terms 'multi-, inter-, and transdisciplinarity', according to Hollmén, are often confused and the terminology thus lacks clarity. The article also addresses challenges of interdisciplinary teamwork and how it can be promoted. Believing that interdisciplinarity, which is widely celebrated at universities and schools of architecture, must be incorporated into the fundamental thinking of curricula design as well as the research agendas of contemporary academia, Hollmén asks: 'How can the disciplines be bridged in such a way that new insights and understanding are generated, rather than merely mandatory, superficially fulfilling curricula requirements?' She emphasizes that many educational institutions suffer from a lack of agility and the ability to adapt to rapidly changing circumstances in society. In her article she draws on her research expertise in interdisciplinary university pedagogy and her experience with interdisciplinarity as head of the Aalto WiT (World in Transition) LAB, an interdisciplinary, cross-school research and education unit that hosts collaborative initiatives across Aalto University in Finland.

SECTION II

The author of the article 'Walking the Line: Exploring A Perambulatory Research Practice' is architect Matthew Ashton, a PhD student at KTH/Architecture in Stockholm. He begins his article by telling a story: In 1905, a Swedish scholar with an interest in geology set out for a walk of 200 kilometres with students from the universities of Stockholm and Uppsala. The expedition team made detailed observations of the Swedish landscape 'to understand the chronology of events that transformed the landscape towards

the end of the last ice age'. In 2023, Aston went on a similar walk in his exploration of the terrain. He finds walking to be a creative, generative, and explorative practice for the mode of entering, experiencing, and investigating the 'presence of the real'. It is a research practice for bringing experience, perception, and intuition into play, through using the body to record, read, and transcribe the surroundings.

According to Ashton, the objective of his article is to 'unpack the act of walking as a creative mode of research'. More specifically, he wants to reflect on how walking can help to increase one's sense of awareness of the phenomenological lifeworld, including social, spatial, and temporal relationships at play in the landscape. He argues for a view from the level of the body, defining the line of walking as a frame of investigation, delimiting the area of exploration to a distinct geographic area. It also functions as a research method, where walking—tracing the line—becomes a primary mode of exploration. The article presents clear and strong arguments about the benefits of using the body and the practice of walking as a research method. The approach highlights the senses and attention to the landscape as central elements in knowledge production. Whilst Ashton does not use the concept of transdisciplinarity in his article, the text includes a series of reflections on how architectural knowledge can be generated with the body as a sensitive tool. Seen from this perspective, walking the line appears to be a fundamentally humanistic method with a transdisciplinary character. Ashton's approach crosses disciplinary boundaries in order to create a more holistic view of the landscape.

The article 'Unravelling Multi-Actor Agencies in a Fragile Landscape' was written by landscape architect Violaine Forsberg Mussault, presently a PhD student at AHO in Oslo. In her article she discusses transdisciplinary methodologies for so-called 'thick' site reading, while explaining how she has used transdisciplinary methodologies to uncover the complex dynamics of the hazardous environment in the Undredal valley in Norway. The twenty-kilometre-long valley is located along the Aurlandsfjord, surrounded by mountain landscapes. According to the author, rockfalls are prevalent in spring, and floods erode sections of the valley floor during torrential overflows. To explore alterations of living conditions in this milieu, Forsberg Mussault took part in an interdisciplinary research collaboration with experts representing many different disciplinary fields, including geologists, geotechnical engineers, hydrologists, architects, and cultural heritage experts. As pointed

out by the author, the group of experts also collaborated with local laypeople when analysing the valley, thus including community perspectives in its work in order to obtain a more thorough understanding of the landscape.

Authorities and planners have 'risk asssessment maps' to guide land use and planning. Whilst they aim to protect settlements, according to Forsberg Mussault, they omit fragile areas in nature, vulnerabilities for animals, and threats to cultural landscapes. Although the maps provide rich data on natural phenomena, they tend to show them as isolated phenomena instead of interrelated processes. When analysing landscapes, Forsberg Mussault thus advocates for nuanced and inclusive research approaches that integrate geological, hydrological, and ecological sciences with situated knowledge, alongside studies of the landscape's human and more-than-human relational dimensions. Her article presents four such approaches to critically engaging with complex sites: 1) '*deciphering forces*', 2) '*unravelling interwoven relationships*', 3) '*understanding community attachments*', and 4) '*exploring more-than-human socialities*'.

Architect Vignir Freyr Helgason, also a PhD student at AHO in Oslo, is the author of the article 'Rethinking the Place Qualities and Cultural Heritage of In-Between Cities'. His article presents a case study focussing on Lørenskog, a rapidly growing Norwegian municipality on the outskirts of Oslo. According to Helgason, Lørenskog is neither a rural or farming landscape nor a city. Instead, the municipality has to be understood as something 'in-between'. Helagason uses the concept of the 'Zwischenstadt' introduced by German architect and urban planner Thomas Sieverts to understand the development of Lørenskog and its character as a municipality. According to the author, urbanization in Norway has followed the 'compact city' model. The outcomes of transformations such as the densification in Lørenskog have, however, raised concerns and engendered resistance among residents. This critique provides a background to the exploration of so-called place quality issues in planning, especially their relationship to cultural heritage. It is also the backdrop of Helgason's article, in which he sets out to examine preservation and development dynamics through a planning and heritage perspective, with the aim to expand the concept of place quality.

In his article, Helgason references how place qualities are described in the Davos Declaration 2018. The declaration sheds light on an international political and cross-disciplinary professional debate regarding the loss of qualities in landscapes as well as in the built environment. Even if the inten-

tions in the declaration are clear—advocating for an approach in which heritage perspectives are integrated into planning and development—it does not provide solutions for planning. Further research and development are thus needed to ensure the quality of peripheral places, and Helgason consequently defines Lørenskog as a 'paradigmatic case' because it is currently one of the fastest-growing municipalities in Norway. The article therefore discusses how place qualities are understood in this context. Helgason argues for exploring new ways of mapping and managing heritage in planning and development for material and immaterial culture to unfold both spatially and socially. According to the author, this calls for a transdisciplinary approach.

Architect Béatrice Stolz, a PhD student at NTNU in Trondheim, analyses transformations in the built environment by focussing on different understandings of architectural qualities in neighbourhoods. With an interest in green transition and spatial culture, her article 'Architectural Qualities of Circular Neighbourhoods: A Review of Sustainability Rating Systems' aims to challenge common understandings of circularity in cities. In general, as she argues, circular developments in cities are made 'to create ecologically regenerative and resilient environments for a transition towards a more sustainable future'. Circular economy strategies and initiatives are furthermore developed to minimize waste and maximize resource efficiency in urban areas. Stolz points out that solutions to address circularity in cities are mostly 'techno-centred', but that she believes 'context- and value-based' practices could unlock circular potentials already present in a place, and that 'a holistic understanding of architectural qualities in neighbourhoods' could be beneficial when implementing circularity principles in such areas. According to the author, a holistic understanding of qualities in neighbourhoods and supporting social considerations necessitate transdisciplinary processes between different actors.

In her article Stolz examines how circularity is understood today, using an analysis of different sustainability rating systems used in Norway to facilitate her discussion. This leads her to the central research question of her article: 'How can a holistic consideration of architectural qualities in neighbourhoods support circularity?'

In the article 'How to Map the Architecture of a Changing Society? An Approach to Examining Schoolyards in Stockholm', architect Matilde Kautsky, a PhD student at KTH/Architecture in Stockholm, investigates how

schools and schoolyards are spaces for education, discipline, and play. Her aim is to understand how changes in society are materialized in the architecture and spaces of everyday life by using schools and schoolyards as examples of such spaces. The main objective of Kautsky's article, however, is to discuss 'how to map the architecture of a changing society', which leads her to reflect on different methods and approaches to mapping. In her article she more specifically addresses three different methods used in combination. As she herself points out, the focus of her article 'is on presenting and discussing the methods, while the results of the research project are presented elsewhere'. In her discussion of methods, Kautsky includes reflections on transdisciplinarity, thus contextualizing her article within the thematic framework of the present book, although, according to the author, 'the article (as such) does not position itself as being transdisciplinary'.

Educational planner Siv Marit Stavem, who is enrolled as a PhD student at the University of Oslo, Faculty of Educational Sciences, is also researching the architecture of schools. In her article, 'The Emergence of Learning Spaces Through Teaching Practices', she brings educational and architectural research together in a transdisciplinary study in which she reflects on how learning spaces can come into being through teaching practices. Drawing on actor-network theory, and taking a socio-material perspective on three specific classrooms in three different Norwegian cities**,** she aims to discuss how the learning spaces come into being through the practice and routines involved in teaching. Stavem believes that learning spaces such as the ones she reports on 'are as much a product of social construction as of technical innovations and devices in the built environment'. Furthermore, she posits that architectural structures do not determine specific actions, but are planned for particular content. As such, Stavem underscores that her article focusses on illuminating how learning spaces emerge through the teaching process and interrelations between different actors via translations and negotiations.

With the compilation of texts in this book, NAF/NAAR wishes to foreground reflections on PhD education and its contents. The book follows on from two previous NAF/NAAR publications on PhD research in the Nordic countries, and is thus part of a small thematic series on this topic published by the association's publishing house.[11] Each book in the series addresses a particular aspect of current PhD research. Although the present publication by no means paints a complete picture of the many discussions that took

place during the NAF/NAAR symposium at the Royal Danish Academy, at which fifteen PhD students spoke, it is representative of discursive tendencies that were presented and voiced in this context. And just as the book makes no claim to being complete in its coverage or account of the role of transdisciplinarity or transdisciplinary studies at the schools of architecture in the Nordic countries, it nevertheless reflects observations and hypotheses that are presented in other larger and more significant publications on the subject matter.

The 2010 volume *Transdisciplinary Knowledge Production in Architecture and Urbanism: Towards Hybrid Modes of Inquiry*, edited by Isabelle Doucet and Nel Janssens, is worth mentioning as an example.[12] The book addresses the hybridization of knowledge production in space-related research and describes architecture (and urbanism)—operating as both a discipline and a profession—as a particularly receptive ground for transdisciplinary research.[13] By endorsing knowledge production that is situated in the architectural and urban planning profession or practice, as well as practice-based approaches in theory, it highlights the importance of new hybrid modes of inquiry that architectural scholars can draw upon when conducting research that engages with broader societal concerns or is embedded in complex, networked, and distributed endeavours. In the present book we also experience a focus on methods, on context-specific negotiations of knowledge, on 'architectural pragmatism', and on 'views from within'. It provides a context for an understanding of transdisciplinarity and PhD research in architecture in the Nordic countries through exemplifying what the students who engage in transdisciplinarity research, how they work, and how they theorize their studies. It is the hope of NAF/NAAR that this book will foster further discussion on these subjects and their relevance.

NOTES

[1] Jørgen Dehs, Martin Weihe Esbensen, and Claus Peder Pedersen (eds.), *When Architects and Designers Write/Draw/Build/? a PhD* (Aarhus, Arkitektskolens Forlag, 2013); Anne Elisabeth Toft and Magnus Rönn (eds.), *The Production of Knowledge in Architecture by PhD Research in the Nordic Countries* (Nordic Academic Press of Architectural Research, 2018).

[2] Although the first formalized doctoral programmes in architecture in the Nordic countries were set up in the early 1990s, several theses on architectural research had already been written in the 1970s and 1980s. In Sweden, early experiments with PhD education—including special courses and an individual study plan for each PhD student—started in the 1970s at the schools of architecture in Stockholm, Gothenburg, and Lund. See Jerke Lundequist, 'Research in Architecture and the Idea of a Social Science', in T. j. M. van der Voordt and H. B. R. van Wegen (eds.), *Doctorates in Design and Architecture*, Vol. 1, pp. 77–85 (Delft: Delft University of Technology, 1996).

[3] Anne Elisabeth Toft and Magnus Rönn, 'Introduction', in idem (eds.), *The Production of Knowledge in Architecture by PhD Research in the Nordic Countries* (Nordic Academic Press of Architectural Research, 2018), p. 11.

[4] Anne Solberg, *Developing Doctorateness in Art, Design and Architecture*, PhD dissertation, Faculty of Humanities, Sports and Educational Sciences, University College of Southeast Norway Kongsberg, 2017, p. 30; *Doctoral Dissertations at the University College of Southeast Norway* 15, link: file:///C:/Users/aet/Downloads/Thesis-1.pdf.

[5] See the Call for Papers: https://kglakademi.dk/naarnaf-symposium-2023-nordic-phd-research-architecture.

[6] https://royaldanishacademy.com/en/research-secretariat/kursusprogram-2024.

[7] https://royaldanishacademy.com/en/research-and-artistic-research-kadk.

[8] See the Call for Papers: https://kglakademi.dk/naarnaf-symposium-2023-nordic-phd-research-architecture.

[9] See the Call for Papers: https://kglakademi.dk/naarnaf-symposium-2023-nordic-phd-research-architecture.

[10] See the Call for Papers: https://kglakademi.dk/naarnaf-symposium-2023-nordic-phd-research-architecture.

[11] *The Nordic Academic Press of Architectural Research* was founded on 6 December 2016. It is the publishing house of the Nordic Association of Architectural Research (NAF/NAAR). The publishing house's *Golden Open Access NAAR Proceedings Series* is ranked at level 1 in Norway, Denmark, and Finland: https://arkitekturforskning.net/na/issue/publishing.

[12] Isabelle Doucet and Nel Janssens (eds), *Transdisciplinary Knowledge Production in Architecture and Urbanism: Urban and Landscape Perspectives*, Vol. 11 (Dordrecht: Springer, 2010).

[13] Doucet and Janssens, *Transdisciplinary Knowledge Production in Architecture and Urbanism: Urban and Landscape Perspectives*, back cover.

LEARNING OUTCOMES: REFLECTIONS ON TEN YEARS OF ENGAGEMENT WITH AHO PHD

Tim Anstey

ABSTRACT

This text is based on a lecture delivered at the NAF symposium at The Royal Danish Academy, School of Architecture on 28 September 2023. The lecture reports on ten years of experience as head of what is now called the AHO PhD Programme (since 2022, AHO PhD School 2013–21) and uses the notion of 'learning outcomes' and the ways of thinking derived from pedagogic theory to structure its themes. In this lecture, 'learning outcomes' describe aspects of obtaining a PhD as a learning process. At the end of a period as a PhD candidate, people (hopefully) know things that they did not know at the outset. Thus, pedagogic models are of relevance in thinking about how that education occurs. Second, while PhD education is, obviously, also about research, there are certain aspects of the 1990s model of pedagogic structures that are very useful for thinking about how research as well as education takes place. A second theme, therefore, is that a useful projection can be made by taking models of pedagogy developed during the 1990s and applying them to thinking about PhD research design at a basic level. Third, like other types of education, PhD learning environments are now conceived as 'programmes', and have entered the cost-benefit analysis systems that are characteristic of late-capitalist systems of investment (whether through private or state initiatives). For those involved in PhD education over the past ten years, the shadow of the meta-systems related to the PhD qualification has become more and more distinct, just as such systems have become more and more formalized for those involved in school or university education. Understanding the impact of such changes is consequently of importance.

KEYWORDS

PhD programme, PhD schools, PhD candidate, PhD qualification

INTRODUCTION

My theme today is the major takeaways from the ten-year period from 2013 to 2023 that I have been responsible for curating the environment for PhD research at the Oslo School of Architecture and Design. The title of this talk, 'Learning Outcomes', is common sense inasmuch as that experience has resulted in things learned. But it is also a reference to three of the themes within this lecture. The term 'learning outcomes' derives from the development of a professionalized discipline in pedagogics that changed the way in which both university—and later general school—educational structures were understood, based on research developed during the 1980s and 1990s. It was a model that sought to question the hegemony of the university lecture as the mechanism through which higher-level education took place, and it was a model that would have a series of run-on effects, both on the way in which advice on how to design systems of education was provided, and, importantly, on conceptions of how systems of education should themselves be measured and assessed. In this lecture, 'learning outcomes' are important because, first, it is clear that doing a PhD is a learning process. At the end of a period as a PhD candidate, people (hopefully) know things that they did not know at the outset. Models for pedagogics are thus of relevance in thinking about how that education occurs. Second, while PhD education is obviously also about research, there are certain aspects of the 1990s model of pedagogics that are very useful for thinking about how both research and education take place.

My second theme is therefore that a useful projection can be made by taking the models of pedagogy developed during the 1990s and applying them to thinking about PhD research-design. The third theme concerns measurement. Like other types of education, PhD learning environments are now conceived as 'programmes', and have thus entered the cost-benefit analysis systems that are characteristic of late-capitalist systems of investment (whether through private or state initiatives). For those involved in PhD education over the past ten-years, the shadow of those meta-systems have become more and more distinct, just as they have become more and more formalized for those involved in school or university education. Understanding the impact of such changes is of importance.

I have spoken so far about the situation of a PhD candidate as part of a programme, as a student being educated, and as a developing researcher.

In order to be more precise, I would now like to provide some background about the PhD Programme at AHO and about AHO as an institution.

ARCHITECTURE, DESIGN, AND LANDSCAPE ARCHITECTURE

The Oslo School of Architecture and Design is oriented around professional-level masters teaching in three programmes—Architecture, Design, and Landscape Architecture—and is organized in three institutes reflecting this agenda. Each institute plays host to one or more centres that curate higher-level research across a range of disciplinary areas. The genres of research vary quite widely. For example, the Institute of Architecture plays host to OCCAS, the Oslo Centre for Critical Studies in Architecture, whose research methodologies are based solidly in the humanities, and whose subject of study is the place of architectural history within contemporary discourse. The Institute of Design at AHO plays host to OICL, the Ocean Industries Concept Lab, which develops bespoke and applied research solutions for the shipping industry based on interaction design. The degree of variation in method that these divergent concerns suggest will be familiar from many other educational institutions where research is pursued in relation to the broad theme of how design effects the human world.

I highlight these two examples because it is evident that almost all the assumptions applied to value research within these two centres—at OCCAS and in the OICL—are different, if not contradictory. Scholars in these two contexts might be able to agree on very general definitions of what research is, and might concur that they aim to pursue their projects with attention to rigor, excellence, relevance, and ethical probity. But if asked what constitutes rigor, or excellence, or relevance, their answers would differ dramatically. And in relation to ethical probity, they would each have their particular concerns. Not only that: Almost all the characteristics of process that apply to these research areas would be very different. OCCAS and the OICL have different ways of valuing knowledge (by author or sell-by-date), different systems of citation and referencing (in-text and footnotes), differing systems of review, varying genres of publication (papers, articles, essays, monographs, reports, pre-press websites all have different significance in these two areas). Of course, they favour particular publishing channels (journals such as *Grey Room*, *AA FILES*, or *Architectural Histories* for OCCAS; publications like *IISE Transactions on Occupational Ergonomics and Human Factors* and *Journal of Marine Science and Engineering* for the OCIL, to name but a couple

of examples on each of the two sides). And they have very differing assumptions about modes of authorship in PhD research. In OCCAS PhD's produce sole-author articles and monographs, while in the OICL authorship is almost always multiple, with supervisors included as authors in PhD writing, and with PhDs based on compilations of such co-written work.

Thus, although AHO is a very small research institution (with around thirty research staff on the faculty and forty active candidates in the PhD Programme), and although it is young (the dedicated centres for pursuing research agendas are a little over fifteen years old; AHO conferred its first PhD qualifications forty years ago), it has a quite complex research ecosystem. Not just across the two areas mentioned above, but also across Systems Oriented Design, Service Design, Industrial Design, Landscape Architecture, Urban Theory, and Preservation and Circularity in Architecture. We are, then, very small in number but very high in diversity, at least as perceived from within.

Onto this divergent environment, we, like many other institutions, impose a single programme for PhD education. We select and fund a yearly group of starter PhD candidates (who almost all commence their first year simultaneously). We require them to take a number of courses together. And we aim to provide a structure that allows for the diversity of output, apparatus, and process associated with the various disciplinary areas in which these candidates operate within a single overarching programmatic schema.

In imposing this model certain tensions must be addressed, and certain communalities found. It is import for us to define what can be considered common and subject to joint discussion and, importantly, what should be reserved for discussion within particular research groups across the institution. I will deal first here with the communalities we define.

We can start with the basic question that must be agreed on within any programme relating to PhD candidacy: What is research? At AHO we follow the evolution established by the UK Research Assessment Exercise (RAE) model, which defines research simply as 'new insight — effectively shared'. This definition is as elegant as it is brief. It allows both traditionally recognized genres and experimental and evolutionary practices to be included in a definition of research. To this we add the sobriquet 'with an ethical frame'. Research for us is thus 'new insight, effectively shared, derived and mediated within an ethical frame'. The reason this definition has been useful at AHO is

that it points to two fundamental questions that we need to answer across all our research specialisms: How do you demonstrate that the insight is new? And how does the sharing happen? Although there may be variations in the answer to these 'how' questions, that there is, or must be, an answer unites our various practices. And—important in a design school—it is clear that these 'how' questions involve a degree of design if one is to answer them. Research does not mediate itself; rather, it is mediated through various forms of apparatus, and these forms themselves have a design. And, simultaneously, research does not of itself declare its newness. To demonstrate that newness also involves a degree of design on the part of the researcher.

Following this initial definition, we ask: Is a PhD research? And our answer to that question is: 'Well, not exactly,' or perhaps, 'Yes, but that does not describe all its essential aspects.' Because what, in fact is a PhD, as currently recognized across disciplines? It is a qualification to practice. This point is perhaps worth being restated and elaborated. From AHO's point of view as a design school, a PhD can be seen as another kind of practice qualification. Indeed, not only does a PhD in its relationship to research imply some level of design in its orbit of problematics (research itself is involved in design both in the requirement that it demonstrate that it consists of new insight, and in the requirement that it must be shared, mediated, or communicated); a PhD also involves an aspect of practice demonstration that is familiar from the traditional pedagogic models that design schools employ. All PhDs, to some extent or another, exist in a context in which a relationship to design and a relationship to practice are central.

I can expand on this with a further question and definition. Let me ask: What is a doctorate? The answer of course is that it is a degree, one by which an individual is given authority to act (or practice) in relation to a body. A Doctor of Medicine is given authority to act vis-à-vis a physical human body; a Doctor of Theology is given authority to act with respect to a body of belief; a Doctor of Literature authority to act in connection with a body of writing. And Doctor of Philosophy is given authority to act in relation to a body of knowledge. Inasmuch as this is a grant or degree, we know that the mechanism of granting it aligns with the 'authorization' involved: The only way to make doctors is through bringing several existing doctors together. The number of doctors it takes to create a new doctor varies: In Norway, you require three; in Sweden, anywhere between four and six; and in the United Kingdom, two. But the process is in principle the same: Existing

doctors make an assessment regarding an individual and confer authority on that individual in relation to their competence to practice research. The qualification is both universal in its assumed value (the degree is not more or less valuable because of the particular body of knowledge over which competence is granted) and also bounded (any PhD must, somewhere, quite clearly define what body of knowledge the PhD candidate claims to be able to operate on with authority).

What, then, do doctors examine when they undertake this process of judgement? They examine competence to practice research within the field or within the subject defined by the PhD candidate and by the candidate's research context. This being the case, in order for the examination committee (the collected doctors) to make this judgement, a PhD candidate must *demonstrate an ability to act in relation to a defined body of knowledge*.

BACKGROUND

Let me then make a first reference to the way in which pedagogic theory grew and developed during the 1990s, which provides useful guidance in connection with the theatre of actions that surrounds this assessment and this demonstration.[1] The diagram describing what should happen in an equivalent pedagogic situation suggests the following:

When you design a situation for learning, you should clearly establish what you wish the student to gain, in terms of insight, through the situation. We commonly call this the 'learning outcome'. There might be a single outcome, but there are usually a set of related outcomes. You then define an activity that the student undertakes through which this insight or these multiple insights can be gained, and which produces a product that enables an outsider to decide whether that learning has been acquired. Third, you evaluate the result of the activity to confirm whether, or not, the learning situation has succeeded (that is, to answer the question: 'Has the student gained the insight(s) intended by the overall design you have put in place?'). This diagram is very familiar, though people have different opinions about its ability to capture the mechanisms that occur in learning. Taken at a very fundamental level, it is extremely useful. And one of its major implications is that assessment ultimately involves 'marking the student, not the work'. That is to say that within a pedagogical framework, if a student submits, say, an essay on a subject in order to enable you to understand if insight has been gained in the situation proposed, success is assessed based not on the essay itself, but on whether, by

producing that essay, the student convincingly demonstrates that they have gained the insight desired.

I describe this diagram (somewhat laboriously) here to illustrate an important and similar principle of examination related to PhD qualification. The doctors who convene to examine a PhD ultimately look at the candidate and make assessments about that candidate's competence. And it is in order to do so that they examine various pieces of work produced by the candidate. In the Norwegian system, those pieces of work fall into four categories. One is the completion of formal pedagogic courses, the educational component (at AHO this amounts to thirty study points, corresponding to about five months of fulltime study). A second one is what we call the thesis: a collection of material which the candidate submits to the committee for review (always in the form of a written document, which might make reference to various other forms of submissions). The third we call a trial lecture, in which the committee asks the PhD candidate to discourse on a subject of the committee's choosing. The fourth we call a *disputas*, in which two members of the examining committee debate the contents of the submitted thesis with the candidate in a public setting. These are the four legs—educational

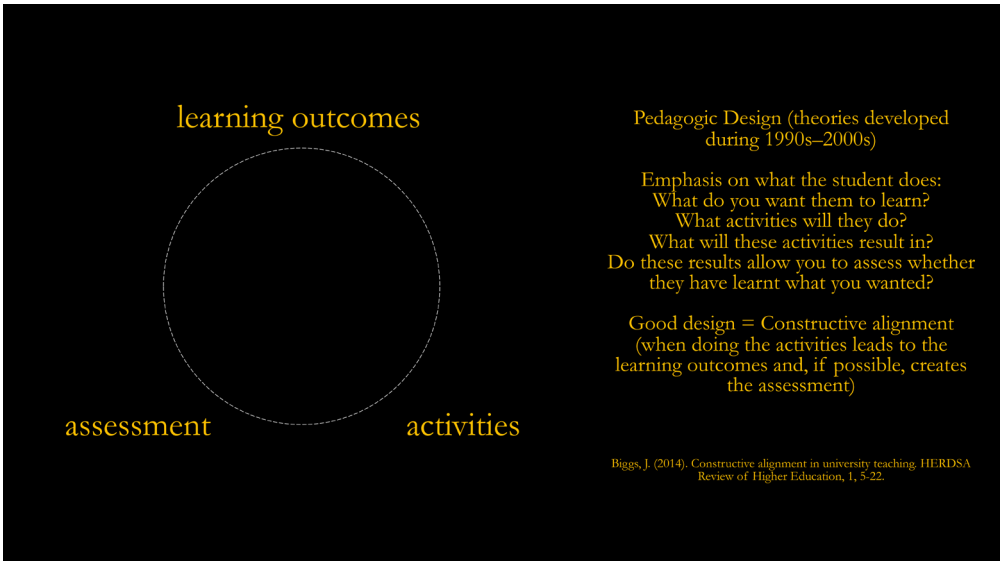


Figure 1. Diagram showing the wheel diagram of pedagogic design. Source: Biggs.

component, thesis, trial lecture, and *disputas*—on which an assessment about conferring the degree of Doctor of Philosophy is made in the Norwegian system. (One endearing characteristic of the supposedly universally common Doctor of Philosophy degree is that there are nearly as many subvariants of the process of examination as there are not only countries but universities in various countries. The form of a PhD exam is perhaps the most diverse of those put in place to assess any of the higher degrees awarded in university education).

THE EXAMINATION AND BASIC CRITERIA

To return to the situation of examining a PhD candidate: We now (in Norway) have three doctors examining three components (thesis, trial lecture, and *disputas*) and taking into account a fourth (educational component, which is approved by the PhD programme) in order to form an assessment. What, then, must each of these components do so that an assessment can be made? Let me start with the PhD thesis, for this is the major component, on which a candidate works for three years of research time in the Norwegian system prior to submitting it. Based on the series of statements above, we can say that every PhD thesis must demonstrate competence to produce new insight, effectively shared, within an ethical framework. And, that being the case, any PhD thesis we examine at AHO, regardless of research genre or specialism must contain:

- something that argues that the insight is an insight
- something that argues that the insight is new
- something that demonstrates the insight is, or can be, shared effectively
- something that demonstrates awareness of the ethical framework

And these broad requirements in turn predict specific aspects of character that will be evidenced in the PhD thesis submission. Where and how they will be evidenced might vary depending on the genres of mediation and research field, but the following will always be included:

- a validation of how the insight in the thesis was acquired (method: a claim that the procedures used in the thesis allow genuine insight to be gained)
- a review of the existing insight to which the work of the thesis relates (review of the field: something which establishes what has been said before in relation to the subject at hand)

These two aspects are required to demonstrate that the insight contained in the thesis is new. In order for an assessment about competence to be made they must be accompanied by:

- a demonstration that the insight is, or can be effectively shared (by demonstration or potential)

This might be performed by means of the nature of the communication in the PhD thesis itself (a persuasive monograph, for example), or through evidence of successful sharing (most obviously instantiated in the case of compilation theses involving the presentation of already published peer-review articles).

This, then, coupled with a demonstration of an awareness of ethical issues, often by means of a reflection, provides the basis for the assessment of competence in relation to the thesis to be made by the committee. The live events (trial lecture and *disputas*) extend the scope of this demonstration and, particularly, enable the committee to be firm in its opinion that it is the candidate themself who demonstrates the various competencies at stake.

In this sense, a programme of PhD research (as distinct from something that would be defined simply as a programme of research) follows the same logic as any other pedagogic situation: It will have a design that aims to articulate its learning outcomes clearly; it will consist of activities and resulting products through which assessments can be made as to whether those learning outcomes have been achieved. Logically enough, our PhD programmes are now described in exactly these terms (a set of global learning outcomes is declared for the PhD qualification nationally in Norway and replicated in a set of learning outcomes identified within the regulations at AHO). What is untypical about a PhD in comparison with most models of pedagogics is that the design of the activities and outputs that enable assessments to be made by an examination committee for a PhD is developed partly by the candidate, through a supervisory relationship, rather than being imposed on the candidate by the PhD programme. The selection of courses that make up the study points that the candidate presents is in part curated by the candidate themselves. And the design of each thesis, the document that presents the logic of activities and outputs, is unique; indeed, the design of the thesis research is one of the activities on which assessments of the competence of the candidate are made.

This way of viewing periods of PhD candidacy as ongoing pedagogic experiences is something we are only really coming to terms with now. Over the last ten years, the development of that notion has been somewhat uneven, at least in our context, and the shift towards it has been organic. One symptom of that shift at AHO has been a move from identifying the formal educational component of the PhD candidacy period as the place where discussions about pedagogy in relation to PhD studies are conducted (discussions about how to run PhD courses and the like, under a banner of a PhD school) to conceptualizing the entire PhD candidacy, including supervision, in pedagogic terms under the banner of a PhD programme. The arguments presented above, which read the entire PhD submission and examination process in terms of a pedagogical model, are relatively recent.

So, what, then, is such a PhD programme? What are its outlines? And how does it deal with the issues with which I started this talk, issues of identifying what aspects can be considered common across our research areas and what aspects must be tailored to the varying research contexts with which our PhD candidates engage? One thing that has become clear is that the division of 'common' versus 'research area-specific' no longer maps onto a division between 'PhD course-based education' versus 'PhD research project'. The gradual move to define both course-based activities and research project-based activities as of equal value in the pedagogic component of a PhD candidacy (that is, both course-based activities and research project-based activities can be thought of in terms of learning outcomes, activities, and products) enables us to rethink how we create learning around areas of understanding that are general and apply to all PhD projects versus those that are particular and vary across our research disciplines. Understanding this has required a quiet revolution in how we think.

At present we curate eighteen study points (three months of fulltime study) in courses that are compulsory for all candidates at AHO, regardless of research discipline, courses which are taken in multidisciplinary groups and are examined by the PhD programme. They focus on the issue of methodological justification (preparing for the aspect of a thesis that a validates how its insight is acquired), on a survey of the field (literature review, systems of citation and referencing that demonstrate that the insight claimed is new), on the development of academic writing (relating to the notion of effective sharing), and on the preparation of the overall design of the thesis document. Beyond that, the PhD programme requires that candidates present

at an annual internal institutional research conference at least once during their tenure, and that all candidates participate in mid-term and final PhD seminars on aspects of their thesis work.

In terms of formalized educational courses, a further twelve points (two months of fulltime study) are curated by the candidate and their supervisor (comprising both courses selected by the student and logged research mediation related to their project). In terms of PhD candidates' time commitment, this means that approximately 10 per cent of their time is spent on activities that are directly curated by the PhD programme and are shared across the institution. Correspondingly 90 per cent of a PhD candidate's time is spent on activities that arise from the context of PhD supervision, either through the design of their own PhD enquiry, through the selection of specialist courses, or through demonstrations of capability in sharing research. Thus, the pedagogical design of the PhD programme emerges 10 per cent from activities that are centrally curated and 90 per cent from this supervisory situation. And, as a corollary, that process itself has to be viewed in terms of pedagogic design.

SUPERVISION: STRUCTURE AND LEARNING

In my experience, cultures of PhD supervision are quite resistant to transparent self-analysis. Most supervisors I know would find it anathema to be required to define specific learning outcomes targeted through supervision and to match them to activities proposed for their candidates with the intention of producing products for assessment of those learning outcomes. Part of the charm and the joy of PhD supervision is that it tends to be carried out without such a bureaucratic and administrative infrastructure being attached to it. But given that a PhD thesis is examined within a pedagogic framework—as demonstrating the competence of its author to practice, as well as being assessed as a piece of research in its own right—it is clear that supervision does require some planning to ensure that the candidate is able to demonstrate such competence in their thesis and *disputas*, and through the activities they undertake in agreement with their supervisor. One way, perhaps, to admit the usefulness of a slightly more reflective practice in PhD supervision and to enable both supervisors and PhD programmes to better navigate the fact that almost all the pedagogic contributions within a PhD arise through the relationship between supervisor and candidate, might be to make a second application of the classical model of pedagogic theory, this time to suggest a parity between pedagogic design (the design of environ-

ments for good and productive learning) and research design (the design of situations for producing new insight).

At AHO we encourage candidates (although not yet supervisors) to explore this parity. The diagram we have developed to show this is formally and structurally similar to those describing pedagogic design. Successful pedagogic design will be clear in linking learning outcomes to learning activities, and will design those activities in such a way that they produce material on which an assessment of the success of the pedagogic situation can be made. This principle is most often shown in terms of the circular recursive pattern already outlined. We ask candidates to use the same diagram of relationships to describe research design. In this case, a research question, or research concern, takes the place of a learning outcome; a planned research activity takes the place of a designed pedagogic activity; and the requirement that this learning activity produce assessable results is paired with a requirement that the research activity is designed to produce some kind of output through which it is possible to assess whether the candidate has answered the question, or addressed the concern, originally proposed. In this case, the sequence is clearly recursive: The output of the assessment will most likely either identify a new question or be used to modify an existing question.

This transference of the diagramming of a pedagogic situation to the diagramming of a research situation has several benefits. On one hand, it makes the planning of research—an open-ended process—more manageable by breaking it into smaller steps that can offer closure in themselves, without being over-predictive about the entire trajectory of enquiry. (For example, this way of thinking challenges certain dogma around the nature of research questions, suggesting that they may be asked at many levels and in relation to tentative lines of enquiry, rather than insisting that they frame an enquiry in its entirety at the outset). On the other, it brings into the question of PhD research-design the aspect of demonstration, which is vital to address if the project is to fulfil the pedagogic requirement of the PhD candidacy as a whole. Using this diagram, it becomes easier to see the relationship between the planning and evolution of the research enquiry and the demonstration of competence that the enquiry is finally expected to achieve and that is examined by a committee of peers at the conclusion of the PhD.

I mentioned that we now test this model formally with PhD candidates (as part of the programme of activities curated by the PhD programme and reflected

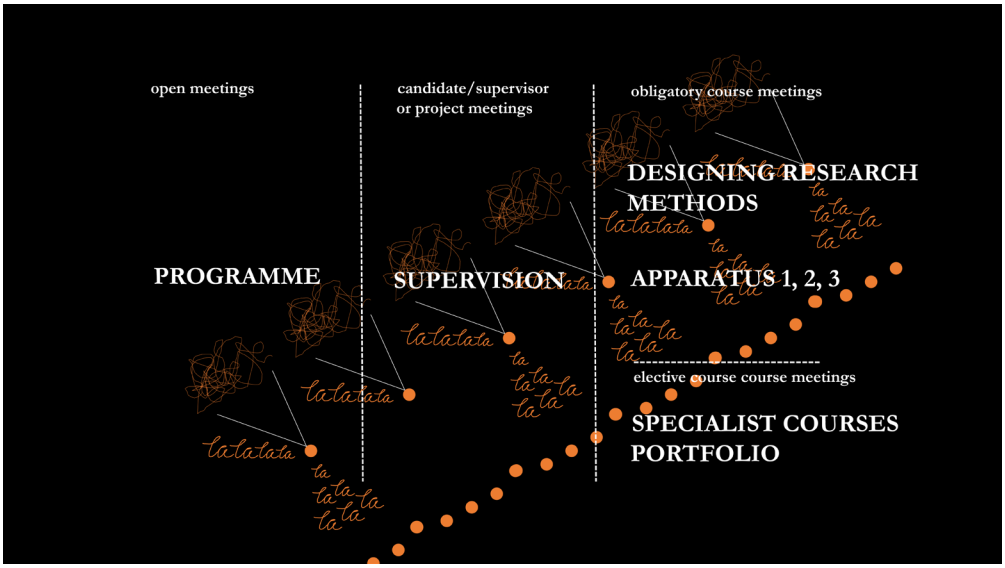


Figure 2. Pedagogic diagram inclusion sequences about examination process and course structure. Source: The author.

LEARNING OUTCOMES

DESIGNING RESEARCH METHODS

- The candidate demonstrates familiarity with research methodology in general and the methods of the specific field of research in particular
- The candidate demonstrates specialised insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used

APPARATUS Reading, Writing Framing AHO PHD COLLOQUIUM

- The candidate demonstrates the ability to identify and formulate issues with scholarly precision critically, autonomously and creatively, and to plan and use appropriate methods to undertake research and other qualified tasks within predetermined time frames and to review and evaluate such work.
- The candidate demonstrates the ability a national contexts to present and discuss research and research findings authoritatively in speech and writing and in dialogue with the academic community and society in general

SUPERVISION ELECTIVE COURSES PORTFOLIO

- The candidate demonstrates intellectual autonomy and disciplinary rectitude as well as the ability to make assessments of research ethics
- The candidate demonstrates the ability in both national and international contexts to present and discuss research and research findings authoritatively in speech and writing and in dialogue with the academic community and society in general
- The candidate demonstrates the capacity to contribute to social development and support the learning of others both through research and education and in some other qualified professional capacity
- The candidate demonstrates broad knowledge and systematic understanding of the research field as well as advanced and up-to-date specialised knowledge in a limited area of this field.
- The candidate demonstrates the ability to identify the need for further knowledge (definition of Context 2 course).

Figure 3. Learning outcomes from the PhD school. Source: The author.

in the design of the eighteen study points of formal educational courses we offer within the programme). And I noted that, in the first instance, we have not explicitly promoted this model with supervisors. That we have not done so can be taken as a critique, inasmuch as it is within the framework of supervision that this form of planning is likely to be expedited. In our defence, I can say that we are in the middle of reviewing with supervisors how we think about supervision and how we build competence in supervision across our faculty. The next steps in terms of designing a PhD programme at AHO that is sustainable for the next ten years concern, almost entirely, better understanding the role of supervision within a pedagogic model for PhD research.

REFLECTIONS

I should also admit that our focus on this issue does not really come from clarity of purpose, or an idealist view of PhD development, but is instead conditioned in part by the assessment systems to which our PhD programme is now subject. And this brings me to the last instance in which the model of pedagogic enquiry based on 'learning outcomes' has become relevant for the development of the PhD programme at AHO. We can now be clear that any of our PhD candidates, in order to qualify for a PhD, must 'demonstrate the competence to produce new insight, effectively shared, within an ethical framework'. But that clarity emerges within a model in which our PhD programme itself is explicitly assessed. In common with most other countries in Europe, PhD programmes in Norway are now assessed based on how they produce PhDs within a financial framework. In Norway, where research institutions receive state financing for PhD candidates, the following has become an implicit question: What does society gain for the three to four million kroner invested? And, assuming that that investment can be seen as acceptable, they are assessed within a framework of performance-based, quantitative regulation: Any Norwegian PhD programme must continuously demonstrate that it meets targets regarding the production of PhD qualifications within specific time limits. In our case, this mechanism of assessment is explicit and draconian. Universities lose their right to confer PhDs (and with it their status as research institutions) if they consistently fail to meet these targets. This new world of public management, to cynical eyes, can be regarded as the principal structure to which the 1990s modernization of pedagogic models responds by means of learning outcomes and requiring a transparency of assessment. My own view is that there is more to these models than that. But regardless of the details, in order to perform in the current climate of financing and regulation around PhD education, PhD

programmes themselves have to adopt something akin to the pedagogic model used to plan educational courses. We need to be clear about what we wish candidates taking the programme to gain; we need to be explicit about how the activities they undertake to gain this insight are planned; and we need them to deliver such output such that our assessors, those who assess the value of the programme, are appeased.

Where, then, does that leave those who seek to plan PhD programmes in the future? From my position I see three burning questions.

The first is a question of bureaucracy. From the statements made above, it is evident that the design of PhD programmes is becoming increasingly bureaucratic. Systems of assessment and reporting take ever-greater amounts of time. Aspects of performance are, or tend to be, defined in a more prescriptive and detailed way. In future, the task will be to navigate this bureaucracy that ensures the quality of a practice without interfering in a fundamental way in key aspects of that practice.

The second is a question of openness. The tendency of all monitoring systems is to close down possibilities: Certainty tends to involve minimizing risk. At present, the funding of PhD candidates through institutions remains one of the few mechanisms in which assessments that open-up possibilities can be made. The cultivation of PhDs that are not predefined by the requirements of funding infrastructure will be something to defend attentively as the navigation of funding regimes changes in the next ten years.

The third is the question of generality versus specificity. I started this presentation by suggesting that a key factor in the design of the AHO PhD Programme is one of a balance between specificity and generality in curating the design of teaching and learning. Traditionally, specific research techniques are developed in projects within the realm of supervision, while general awareness is developed in formalized cross-programme courses. During the next ten years, I think it is likely, both at AHO and more widely, that the question of how supervision operates to develop research will be examined more closely, and that forms of supervision will change. I believe, finally, that this change will challenge the way in which we structure the distinction between 'educational' and 'research-based' activities in PhD studies, and that the notion of learning outcomes will play a fundamental part in that reassessment.

NOTES

[1] On the development of the idea of constructive alignment and the evolution of recursive diagrams relating to pedagogics, see J. Biggs, 'Constructive alignment in university teaching', *HERDSA Review of Higher Education*, 1 (2014), pp. 5–22.

INTERFERENCES IN ARCHITECTURE: ON THE ART OF 'TORMENTED' WRITING AND THE FUTURE OF ARCHITECTURAL RESEARCH

Albena Yaneva

ABSTRACT

To address questions about the investigatory and written approaches in architectural research today, in this article I outline the possibilities for a new form of architectural research, *an earthly one*, that comes from within the field of practice and remains at close proximity—not at a critical distance—to its objects of research, that does not assume that knowledge about design—or urban life—is something already out there to be easily discovered. Instead, knowledge is to be created and traced through new methods of enquiry that resonate with parallel developments in diverse fields.

This leads us to refresh our conventional understanding of inter- and trans-disciplinarity, and to abandon the simplistic idea of transferring concepts between or borrowing methodologies from established disciplines. To be able to resourcefully address the thorny issues in a world of architecture damaged by extractivism and confronted with the climate emergency and wars, we must increasingly rely on mutual interferences and echoes among fields. The disciplines impinge on one another and enter into relations of mutual resonance and exchange, but always for internal reasons and revolving around these issues. This also often happens in slow and tantalizing ways and prompts us to perfect the art of architectural writing, to invent *a new syntax,* a new grammar, and new compositional principles for writing. Such accounts will offer close interpretations, will gain the ability to intervene in design worlds, to make a difference.

KEY WORDS

architectural research, methods, interdisciplinarity, writing techniques

A TALE OF TWO WRITERS

In his seminal novel *If on a winter's night a traveller*,[1] Italo Calvino draws the fictional characters of two writers: one 'productive' and one 'tormented'. They are both working feverishly. Picture them on a writing retreat in the mountains, each of them working in a chalet on the top of a hill. One of them works in the morning, the other in the afternoon. When they are not writing, each of them secretly observes the other with a spyglass, trying to find out more about the other's working techniques.

In the morning, the 'tormented' writer watches the 'productive' writer filling page after page, the manuscript growing in a pile of neat pages. 'What a clever craftsman!' he thinks. He envies him, but is also full of admiration, yes, sincere admiration! He admires his 'energy, generosity, his faith in communication'.[2] 'The tormented writer' wishes he had the same confidence and pace of work when writing. In the afternoon it is his turn to work. The 'productive' writer watches the 'tormented' writer sitting down at his desk, chewing his fingernails, scratching his head, tearing a page to bits. He then gets up and goes into the kitchen to fix himself some coffee, then reads a poem in search of inspiration, and then looks at the encyclopaedia … Still nothing. 'He struggles, oh, he struggles so much! Yet, this man is struggling with something deep, obscure, a tangle …'[3] And that is why, paradoxically, instead of feeling self-complacent about his own achievements, the 'productive' writer is overcome with admiration. 'Not only admiration, but also envy! This leads him to believe that his own work is superficial compared with the depth of the tormented writer.'[4]

Picture another scene. On a terrace in the bottom of the valley between the two chalets, a young woman is sunning herself, reading a book. The two writers often observe her secretly with the spyglass. Look at her and how captivated she is by the reading! She is holding her breath; she is feverishly turning the pages. The 'tormented' writer thinks that she must be reading a novel of great effect, like those by the 'productive' writer. Yet, the 'productive' writer deeply believes that she might be reading a novel rich in hidden meanings like those by the 'tormented' writer; she looks transfigured, as if a mysterious truth has been disclosed. Only the 'tormented' writer can make the reader feel transformed by revealing a deep and obscure truth, by disentangling a secretive tangle, the 'productive' one assumes.

Witnessing the 'tormented' writer working at the start of the tale, we, architectural writers, tend to identify with him; we watch him tearing up page after page, struggling to resolve problems with words, envying the productivity of others, typically social scientists. Yet, as the tale unfolds, Calvino reinforces the belief that there is value in being a tormented writer, that tackling unsolved problems and seeing more tangles than solutions is worthwhile. Indeed, today we no longer have the luxury of simply reflecting 'on' architecture by adopting a stance inspired by Critical Theory, by borrowing readymade ideas from many productive critical writers. The urgency of contemporary problems, their complexity, scales, and speeds, require us to find new and swift ways to apprehend the dynamic 'waves' of urban development and design practice.

But how can this be done? From a panoramic viewpoint or from the ground? By retaining proximity, immersing ourselves, and becoming tormented? Or by keeping a critical distance? By slowing down or speeding up? By following the key protagonists or everyone? By tracing humans or the more-than-human? By tracking speeds of formation or the entities already shaped? Are our methods of research agile enough to capture all these inner dynamics and entities, all the undercurrents, to seize these 'winds' and to create new ones? And, if so, what are the investigatory and writing approaches that will allow us to grasp the speeds and movements of contemporary architecture, and to tackle topical issues in the field?

To address these questions, here, I will outline the possibilities for a new form of architectural research, *an earthly one*, one that comes *from within the field of practice.* One that does not assume that knowledge about design (or urban life) is something already *out there* to be easily discovered by many naturally gifted, productive writers, or solely by one discipline. Instead, it has to be created and traced through new methods of enquiry that resonate with parallel developments in many fields, and thus leads us to refresh our dusty understanding of inter- and transdisciplinarity. Moreover, this often happens in slow and tantalizing ways and prompts us to perfect the art of tormented writing.

THE RUNNER AND THE SURFER

Critical Theory-inspired architectural research has dominated the field in the past three decades or so[5] and has been marked by a return to abstractions. It has led contemporary architectural researchers to embrace a linear movement. A linearity reminiscent of sports like running or shot put. A linearity that implies a starting point, a lever, and requires effort and resistance. Alternatively, sports like surfing, windsurfing, and hang-gliding take the form of entering an existing wave. 'There is no longer an origin as starting point, but movement of "putting-into-orbit."'[6] Running from point A to point B is predictable, it follows a straight, step-by-step progressive effort; rare are the surprises. Surfing or windsurfing, by contrast, are a full-blown adventure. There is no linearity or logical progression, but instead shifts, disjunctions, turns, subversions, rescaling and adjustments, falls, and new winds. Architectural research today suffers from the boredom of runners, of causative linearity, where movement is restricted and predicable. Instead of running between eternal or historical values simply in search of 'whys', of reasons, of causality, architectural research could thus try another move—the adventurous one—to be taken up in the motion of the big waves of design practice. The artificial separation between the 'why' and the 'how' of architecture-making does not lead to creative solutions. Instead of searching for origins or external values, entering into the turbulent 'waves' of design would imply a different type of research, a painstaking, a tormented one. How can we surf these waves?

THE WAVES OF DESIGNING

Watch designers at work drafting, scaling models, discussing them with clients. Follow the confused trajectory of dwellers in a building, on an urban square, or on their underground commutes. Watch them with amusement, perplexity, or scandal. Slowly! To continue to apply critical concepts to these earthly design and urban realities is to incur the risk of speculative interpretations that will remain detached from reality, and whose relevance will fade with time. Believing that a building or a city can be seen as totality, as an objective frame, is a pragmatic absurdity. Instead, we can opt to stay on the ground and try to abandon all panoramic and panoptic ways of looking at building or cities. Forget about the viewing platforms of the Empire State Building, the Burj Khalifa, or the Pearl Tower—did you believe that New York, Dubai, or Shanghai could be seen from up there? But they can't! Forget about the offices of Norman Foster, Rem Koolhaas, Alvaro Siza—did you believe that their buildings could be understood from up there? But they can't! We rarely witness a building or a city 'as a whole'. Abandon all sites

where we talk about these activities from an abstract perspective! Focus instead on the small sites, on those misty locales of design or urban practice where very little can be seen, but can be seen *well*. Such sites, which Bruno Latour terms *oligopticons* in opposition to panopticons, are fundamentally invisible.[7] Examples of oligopticons include architectural studios, model workshops, conservation labs, and traffic control rooms, among others. All these rare places are situated on the ground, not up on the top. There and only there, it is possible to see only very little, but it can be seen really *well*. To capture designing or dwelling in urban spaces, we should meander through these sites of practice, trace and compose them. Only realistic accounts of their dynamics can allow us to enter into the 'waves' of cities.

Observe the oligopticon of any architectural office or urban setting. In the office one can capture the contingency of design process as key for understanding how buildings, cities, and environments come into being. To grasp the meaning of these buildings, we need to forget the star architect for a moment and turn away from official interpretations, to circumvent as well traditional understandings of star-authorship (in the spirit of subjectivist interpretations) or critical-historicist interpretations. Instead, follow the sketches, the models, the foam materials, the software, the 3D modelling tools mobilized by architects in order to design, but also the entangled networks of engineers, clients, professional modelmakers, and interior designers. This would also mean accounting ethnographically for the ordinary forces and conditions related to how design is experienced, following many young designers in the office and the paths they have traced in their work. We can track the way their actions spread, and how architects make sense of their world-building activities, the routines, mistakes, and workaday choices usually considered of lesser importance. Through so doing, we can arrive at a better understanding of the projects and buildings of a firm by means of a detour to design experience. We will thus avoid all sorts of progressive and linear 'running' and pass through the vague notions of culture, society, and origins—which ultimately do not explain anything.

While trying to understand and interpret what happens in these ologopticons, we will abstain from referring to any 'dark forces' (the market, capitalism, neoliberal economy), to any 'bad guys', indeed, nor will we invoke an explanatory construction of continuity (which every runner knows well) that refers to something beyond our control—cultural forces, the zeitgeist, social influences. We will simply follow the 'adventures' of design, its twists, and

unpredictable turns, a world in which all continuity is questionable. Design takes place in circumstances that are specific every time and with stakes that are always different. To interpret it, we no longer search for an ultimate explanation, but instead simply tell our stories of design in another way, in a way that situates us otherwise—not as defined by the past behind us, by extraneous forces, but as perhaps able to learn from in another way. Stories of modelmaking and recycling tell us what makes OMA specific,[8] stories of trips to a particular site tell us what makes Miller Howard Workshop specific,[9] stories of making renderings tell us what defines the uniqueness of Kengo Kuma's Japanese approach to building with bamboo,[10] stories of the tribulations of wooden materials amplify the various ways in which the object-in-the-making participates in the design decisions of a firm.[11] Long is the list of storytelling developed by pragmatist architectural researchers in the past fifteen years or so.

While deploying all these stories, our research will add the 'whys' of designers' experience to the 'hows' of the objective reality of design-making. Instead of asking: 'What caused this? In what way is Portuguese culture, for instance, embedded in the design of OMA's *Casa da Música* in Porto? How is British cultural politics reflected in the extension of British Museum by Foster + Partners?' The questions to be asked are: 'What unique adventures in design made this possible?' 'What matters to designers and to all the participants in making architecture?' 'How and where?' 'Where and how?' 'What does success mean?' 'Under what circumstances can it work for the inhabitants and how will it be judged?' No high levels of complexity, no superiority of society or culture will be added to the explanation, no glorifying appraisals. By spending more time on carefully describing and recounting 'how' architecture happens, how design is produced, communicated, negotiated, and shared, these lengthy and painstaking stories of design-making will finally provide answers to the 'why'. This slow and skilful earthly critique *from within* should be able to demonstrate that the 'hows' conceal the 'whys' of design undertakings. The architectural firms where we deploy our ethnography (observing and describing the culture of practitioners) will appear as star-like connecting sites, local places where the global, universal values, contexts, and cultures are assembled and reassembled.

In all these situations we witness how architecture unfolds. Staying on the ground helps us to enquire into the current conditions of life in the world we inhabit and to recognize all the participants, all the 'unsung heroes' the

young designers, foam, and foam cutters in the practice, not merely the star architect. If we follow how mundane architectural objects become archival by scrutinizing the steps and the mechanisms of production of archives in design practice, we will be led to acknowledge the role of conservators, technicians, and solvents in an archive, not just that of curators and architects.[12] This realistic, *earthly*, approach enables us to take into account all sorts of practical work that contributes to the making of knowledge in architecture. In all these cases, we join an active, ongoing process of exploring, testing, repairing, and reappraising the architectural connections of design objects to the world; we enter into the waves of practice, the orbits of designing or urban dwelling.

To fully understand the adventure of design we need to follow it slowly. No rush to explain it or replace it with the quick concepts of society and culture. By exploring a design process or a building through design practice or repeated visits to a construction site, we can experience the various speeds and intensities of the processes unfolding there, the changing crowds of people and flows of things; we can observe, document, interview, and trace various activities, movements, and gestures. Follow all these waves and shifts slowly and through their presence and immediacy and you will grasp the specificity of various architectural institutions, will gradually gain experience of architectural objects and processes with respect to their own qualities and relations. It is this rich experience that will form the core of our interpretations. This, I will argue, is the only foundation for architectural theory, and for meaningful research.

THE NONHUMANS

Taking into account the different modes of making, staying on the ground, and following slowly, we can also give speech to that which has no language: to the foam, the cutter, the software, the mould, the sketch. All these nonhumans are part of the stories of design because they transmit action. It is through the shifting of action from designer to sketch, to pencil, to model, to foam, to drawing, and to potential spaces and objects that designing happens. There is not simply a subject and an object, an architect and a model, an archivist and a mouldy drawing. Following how these nonhumans move back and forth between sites enables us to witness how a design object, a city, or an architectural archive becomes knowable, traceable, and functions. If we abandon the duality between free, creative entrepreneurial design spirits, and regular submissive materials, a duality bequeathed to us since modernity, we

will be able to produce accounts that more realistically depict design adventures from within.

Taking design into account from within implies fully considering the demands of the environment, both human and nonhuman, on which the success of design experimentation depends. Yet, this ability does not exclude human beings (designers, architects, clients, users) from becoming active, discussing, and hesitating, but also solicits and mobilizes them around the eventuality of the creative achievement—the new idea, the groundbreaking form. This is an achievement that no critical analysis of the design production could justify (based on the forces of culture, politics, markets). It belongs to the order of an event in the design process and does not correspond to any external reality.

Design novelty is an achievement that is rare, extremely selective, and radically situated. What situates it is not the world of design, as extensively taken into account in recent studies of design practice,[13] but the experimental apparatus of designers at work—the foam models in the hands of OMA architects, the renderings in Kengo Kuma's office, the CATIA models in Gehry's practice—for the questions that matter to designers are established around this experimental apparatus, not from the outside. It is *here* that designers become active and that the art of testing, trying out, recycling, and evaluating the consequences of design is performed.

The correlation of testing and consequences is at the core of each design event. Thus, rather than providing a merely subjective interpretation of design-making or an explanation referring to extraneous objective forces, simply witness and describe all these events of making, all these special moments when 'something happens', though it cannot be defined or explained by means of the 'why' of human subjectivity or historical forces. There is no need to debunk or resist it, to unveil the hidden forces driving it. Rather, accepting it in its selective and rare uniqueness will help us to understand it better. Regarding solely powerful humans as making design happen does not suffice. Listen to *all* the protagonists in design-making—the engineers and the structural models, the architects and the sketches, the contractors, clients, builders and their calculations—tell the story of their achievements without having to challenge them, for they are situated in, and belong to, the same adventure of architecture.

MAP AND AMPLIFY: THE HEURISTIC POWER OF VISUALS

Following slowly, remaining on the ground, the knowledge practices of designing, dwelling, or archiving emerge as frangible networks of praxis. To better understand them, we should engage in visualizing them by tracing the heterogeneous formation of relations. In the very process of mapping, diagramming, and sketching, we can discover the constitution of an actor or connections whose format and magnitude might not be apparent at the start. Mapping is an epistemic tool that can offer visual strength to analytical arguments made on the basis of traditional qualitative methods (archives, interviews, observations). The versatile use of digital mapping techniques can enhance the depiction of a degree of complexity that is difficult to capture otherwise.

Moreover, it is crucial to shift the focus beyond single sites of practice and to grasp the 'figurational' dimensions of collaborative networks. Two years of ethnographic observation in an architectural practice in an archive cannot simply be replaced with a 'figurational' map. Yet, understanding such dimensions could be greatly enhanced by visualizations that situate them within a larger 'galaxy' of professional relations. Here the resonance with the visual arts, performance, and even film is crucial. Moreover, a clever use of visuals (the kind of images that only architects can generate) can strengthen, amplify, and enrich the arguments rather than merely providing simple illustrations.

A NEW NARRATIVE TECHNIQUE: THE ART OF 'TORMENTED' WRITING

Further grasping the adventures of design, taking into account the dense contextuality of designing in flesh, of all rhythms and speeds, will require new writing techniques that will help us to gain access to the unique without replacing the specific with the general, without jumping to and unveiling what is behind architectural objects and processes. Reflecting on the materiality and performativity of writing, Bruno Latour advocates a form of writing that is capable of closely following how a specific action unfolds and could be made possible by its 'network'. He states, 'I had the feeling that any consideration was *abstract* as long as it could not follow the step-by-step trajectory that allowed one element to be made visible through the conspiracy of all the other elements still active in the background.'[14] If we avoid jumping and referring quickly to big concepts, but instead track the continuity of agency slowly and progressively, painstakingly pay the price of each connection,

and remain *at a critical proximity*, not at a critical distance, we will be able to embrace an approach to writing that, albeit tormented, may prove more fruitful.

Situating ourselves within the heart of urban or design life so as to capture its specificity can inspire us to invent *a new syntax*, a new grammar, and compositional principles for architectural writing, a foreign language within the language. Writing will therefore require us to embrace a *liquid rhetoric*, thus enabling us to capture states of affairs in practice with no fixed shape or size, but with lots of empty space and kinetic energy and with lower densities (not hard concepts and definitions borrowed from other fields). This new syntax can defy conventional perceptions and opinions that are commonly solid and geometric, certain and formal, immutable and linear.

This would mean, becoming 'earthlier', as Deleuze would say, 'by inventing laws of liquids and gases on which the earth depends'.[15] In the spirit of this new syntax of architectural research, writing will not mean putting words and phrases together, using ideas, combining concepts that come from other fields, or explaining. It would instead imply *opening up the words* of designers and questioning their inner meaning, breaking things open: What is a 'smart' solution to a brief? What does it mean to design in an ecologically friendly way? The specific design practice of each firm generates an internal infra-language in the office—a particular way of speaking skilfully invented by designers to facilitate communication when things flow back and forth between projects and experimental models. Without understanding this locally crafted and contextually dense playground-type of language and how it is connected to the inner waves of practice, we would not be able to capture the unique adventure of design. A pragmatist[16] writing style will open up the meaning of the words of all makers, will connect the discursive with the nondiscursive, will stage and re-establish the freshness of making, will disclose the links to how these design works come into being and the way in which they gain meaning in design experience.

Remaining at a critical proximity to design can facilitate the generation of infra-reflexive accounts of invention that will retain the sparkle of design-making, the genuine experiences, and the inexactness of language, accounts that will circumvent any meta-reflexivity and any reference to distant interpretative frameworks outside architecture. Thus, rather than an

imaginative process, in our heads, this form of tormented writing will lead us to produce existence, real characters and bodies; not static and mute, but alive, uncertain, informal, and moving as we speak. The work of experimental writers like Italo Calvino and Georges Perec and literary theorists like Roland Barthes can further inspire us to perfect our 'art of describing' design environments and urban atmospheres and to produce accounts that trace and measure the pluriverse of design and city dwelling.

Just as design invention is all about mediators, so is the art of architectural research. Without them nothing happens. They can be people (intellectual mentors, fellow designers, artists, publishers, students), but also things that inspire us (new technologies, academic institutions, journals, professional societies, novels and art). As Deleuze states, 'I need my mediators to express myself, and they'd never express themselves without me: you're always working in a group, even when you seem to be on your own.'[17] Just as creativity in art and design has little to do with the unique talent of a solitary genius—as argued by art scholars, from Michael Baxandall and Svetlana Alpers to Howard Becker and Nicolas Bourriaud—but is instead the mundane product of a versatile network of cooperation, so is architectural research. Deeply rooted in networks of multiple partnerships, its mediated nature is becoming even more palpable today with the advent of numerous AI-generated forms of creative work and collaboration.

INTERFERENCES

It is moreover necessary to keep in mind that the research problems we are confronted with in a world of violence and extractivism—from climate emergency and depletion of resources to wars and migrants' crisis—are extremely complex and enmeshed in contradictions. Their scale, gravity, and duration have yet to be fully unpacked and apprehended with respect to how they impinge on the built environment. To unravel them, we need to abandon the simplistic idea of transferring readymade concepts or mere borrowing methodologies between established disciplines. This also denotes moving away from the tired concept of interdisciplinarity, and even from transdisciplinarity.[18] As Deleuze warns us: '[A] discipline that set out to follow a creative movement coming from outside would itself relinquish any creative role.'[19] To resourcefully address these entangled problems, architectural research today relies more than ever on mutual interferences and echoes amongst fields: philosophy, art, the natural sciences, literature, and the social sciences

(psychology, sociology, anthropology). They impinge on one another and enter into relations of mutual resonance and exchange, but always *for internal reasons* and around specific, difficult-to-tackle tangles of import (issues such as activating community engagement in design, speeding up the response to the housing crisis, making carbon sequestration impactful, amongst others). In order for them to be addressed, these issues require many parallel movements and melodic lines of different disciplines in on-going interplay with one another.

To navigate the instable waters around these thorny issues, we need to slow down, trace, turn, surf, and capture the internal dynamics of network formation. Abandoning all solid states, all abstractions, all panoramas, all grand attempts pointing to the timeless nature of architecture works, to enduring values, to external factors, architectural research will rely on careful tracing, interferences, and liquid syntax to generate resourceful *critique from within the field of practice*. Instead of posing questions that interrogate the origins, of making big leaps to essence, causality, and explanations, such as 'What is it?', 'Why is it made this way?, 'What caused this development', 'What factors led to this form of architecture?' the new form of *earthly research* should pose questions of a radically different nature: 'How does design happen?', 'How does it work?', 'How does it engage in motion?', 'In what cases?', 'How and where?', 'Where and how?', 'What are its modalities of action?', 'How does it become traceable, knowable?', 'Under what circumstances can it be seen, grasped, and composed?' The 'how' and 'where' questions will contribute to putting things into new orbits. Gradually and slowly, with excitement and bewilderment, it is these questions that will get us taken up in the motion of a big wave, a column of rising air. They will contribute to new movement, to new 'winds', and, eventually, to change.

Thinking critically from within the field of practice requires us to embrace a critical proximity to the process of design rather than maintaining a critical distance, and, by so doing, to let our own interpretation be chemically dissolved by the 'objects' of study. Equipped with this style of research, we can no longer abandon 'matter' as a term of depreciation, let 'practice' be seen as a synonym of banality, and 'design experience' be considered trivial, as something to be explained away or apologized for. We can no longer renounce what matters to designers and continue to impose concepts from

other disciplines that are irrelevant to them. They are the ones capable of detecting design events, processes, weaknesses, and new ideas. We should continue to question what is it that designers do, just as we should continue to interrogate what is it that we all do as urban dwellers, what this signifies and enacts. Thinking critically from within means questioning other modes of thinking by asking what impact they have on our thinking, on our practice, and what they render important or cause to remain silent.

Finally, our research should be able to make difference. But how? Let all writers, good or bad, productive or tormented, speculate on what books captivate readers and how they are transfigured in the very act of reading. Abandon all comparisons! Cease all transfers! Suspend the zoom! Multiply instead the techniques of data collection, the sites of investigation, the epistemic tools and voices that can inform our research and writing. That is what will bring us closer to understanding the tangles of design. To understand is to be able to transform. Meticulously taking into account the variable settings of designing—as shambolic, contingent, and heterogeneous as they might be—by situating the enquiry in 'the belly of the monster'[20] will enable us to actualize the power to transform. But how? The more we immerse ourselves in the monstrously complex worlds of design, the more we comprehend and learn from them, the more specific our interpretations and accounts will become, the more our ability to intervene in design worlds will increase. Depending on the angle we take or the actors we follow, at a certain point these accounts will start interfering in our object of study. They will become performative. That is how we will intervene and eventually make difference.

Architectural research is thus assigned a new mission: unravelling the multifarious connections between architectural works and the conditions of their making by following the raging and often treacherous waves of design and urban practice. This new style of research will contribute to interrogating the relevance and limits of design-related knowledge practices and be able to gradually and slowly inspire change. And what will then happen to us, architectural writers? If instead of tirelessly running from one fixed point to another, we embrace the hazards lurking in surfing the waves, their unpredictable turns and adrenaline-like excitement, we will be finally able to enjoy a unique way of being tormented by design.

NOTES

[1] Italo Calvino, *If on a Winter's Night a Traveler*, trans. William Weaver (New York: Harcourt Brace Jovanovich, 1981).

[2] Calvino, *If on a Winter's Night a Traveler*, p. 132.

[3] Calvino, *If on a Winter's Night a Traveler*.

[4] Calvino, *If on a Winter's Night a Traveler*, p. 133.

[5] See Neil Leach (ed.), *Rethinking Architecture* (London and New York: Routledge, 1997), and Ian Borden and Jane Rendell (eds.), *Inter Sections: Architectural Histories and Critical Theories* (London and New York: Routledge, 2000).

[6] Gilles Deleuze, *Negotiations*, *1972–1990*, trans. Martin Joughin (New York: Columbia University Press, 1997).

[7] Bruno Latour and Emilie Hermant, *Paris, Ville Invisible* (Paris: Les empêcheurs de penser en rond/La Découverte, 1998).

[8] Albena Yaneva, 'Scaling Up and Down: Extraction Trials in Architectural Design', *Social Studies of Science*, 35 (2005), pp. 867–94, and idem, *Made by the Office for Metropolitan Architecture: An Ethnography of Design* (Rotterdam: 010 Publishers, 2009).

[9] Thomas Yarrow, *Architects: Portraits of a Practice* (Ithaca, NY: Cornell University Press, 2019).

[10] Sophie Houdart and Minato Chihiro, *Kuma Kengo: An Unconventional Monograph* (Paris: Editions Donner Lieu, 2009).

[11] Pauline Lefebvre, 'I, T.T. Stands. Two Days in the Life of an Object in the Making', *Ardeth*, 1/2 (2018), pp. 97–119.

[12] Albena Yaneva, *Crafting History: Archiving and the Quest for Architectural Legacy* (Ithaca, NY: Cornell University Press, 2020).

[13] See Dana Cuff, *Architecture: The Story of Practice* (Cambridge, MA: The MIT Press, 1991); Houdart and Minato, *Kuma Kengo*; Yaneva, *Made by the Office for Metropolitan Architecture*; and Albena Yaneva (ed.), *New Voices in Architectural Ethnography*, edited volume of *Ardeth*, 1/2 (2018).

[14] Bruno Latour, 'Life Among Conceptual Characters', *New Literary History*, special issue *Latour and the Humanities*, 47/2–3 (2016), pp. 463–76.

[15] Deleuze, *Negotiations*, *1972–1990*, p. 133.

[16] Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press, 2005).

[17] Deleuze, *Negotiations*, *1972–1990*, p. 125.

[18] Nel Janssens and Isabelle Doucet (eds.), *Transdisciplinary Knowledge Production: Towards Hybrid Modes of Inquiry in Architecture and Urbanism* (Berlin: Springer Nature, 2011).

[19] Deleuze, *Negotiations*, p. 125.

[20] Donna Haraway, 'Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective', in *Simians, Cyborgs and Women: The Reinvention of Nature*, ed. Donna Haraway (London: Free Association Books, 1991), pp. 183–201, esp. p. 581.

DWELLING IN THE 'IN-BETWEEN' OF DISCIPLINES

Saija Hollmén

ABSTRACT

Transcending the boundaries of siloed disciplinary structures within universities has become more and more important—because in the world outside academia, this is the reality. Graduates inevitably engage in constant interaction with colleagues with diverse knowledge bases. Universities have the potential to initiate developments that may have far-reaching consequences, affecting the ways in which the future professionals who will shape society will work.

In this article, I debate contemporary definitions of interdisciplinarity, as the terms multi-, inter-, and transdisciplinarity are often confused and the terminology thus lacks clarity. I also discuss the challenges of interdisciplinary teamwork and how it can be promoted. To facilitate 'dwelling in the in-between of disciplines', I present some general conditions for creative thinking that can facilitate the exploitation of the human mind's creative capacities. I argue that engaging in such a process is a way to generate new interpretations and nonlinear combinations between the diversifying types of knowledge within and between complex systems. New instrumentalities for experiencing the world can emerge when the processes of various knowledge bases interact: Connecting such relations to one's nondisciplinary intuition can allow them to unfold in a meaningful way.

KEYWORDS

interdisciplinary terminology, teamwork, intuition, creative practices

THE CHALLENGE OF INTERDISCIPLINARITY AT CONTEMPORARY UNIVERSITIES

Specialized expertise has become the prevailing denominator in Western culture. The progressive deepening of each discipline over time has taken all of them to a level that is out of reach for all-round education and common knowledge. Subsequently, the disciplines tend to segregate as expertise deepens. The 'big picture' to which all specialisms are somehow linked thus becomes a significant challenge both within and across disciplines, as it also relates to the public sphere. Knowledge relationships may become distorted from an individual perspective. Individuals can access insights emerging from other domains only via intuitive means, additional study, or commercially mediated information. These factors establish the need for a bridging strategy with multiple strands: visual, technical, mathematical, experiential, experimental, artistic, and applied.

The societal and cultural challenges we are facing today have a greater complexity than can be addressed by single disciplines. A pressing need therefore arises for appropriate collaboration techniques so as to augment existing strengths and elevate them above common assumptions. For example, engineering is often considered, more often than not by engineers themselves, to be a discipline that involves little creativity, as though creative insight is associated only with certain denominations of work or individuals. Even university entrance examinations underscore the presumption of a person being either creatively-artistically or scientifically oriented. This presumed dichotomy is fundamentally false: Engineering, for example, at its best, is about finding complex technical solutions to newly emerging and unequalled problems and challenges. In both the arts and engineering, questioning the prevailing conditions to reveal new and unexpected connections is the focus of attention. Intuition, various forms of knowledge that connect to our senses, and critical and creative thinking are woven into both art and engineering to an equal extent. Creativity is thus not a given attribute of any particular activity, but rather an intrinsic human ability that can be either fostered or eroded by approaches to education. It is a human capacity that we all possess and can be cultivated to benefit our connectivity with the world.

Many universities face the challenge of adapting to their rapidly changing relevance within the societal needs of the future. Universities may no longer be the keepers or arbiters of knowledge or data—instead, as has now become apparent, the emerging need is for universities to emphasize the mentoring

of complex issues across generations. In this context, the intuitive dimension of scientific work needs to be included within an array of critical thinking skills and practices, rather than being regarded as an irrational component. Such skills are essential for the intelligent use of language, visualization, representation, and practices within complex domains, and also where grassroots activity is an essential source. Intuition is a crucial component of human decision-making and creativity, leading to both scientific and artistic innovations.

KNOWLEDGE SHARING AND COLLABORATION

Knowledge is no longer possessed by an individual, but rather by groups of people. Access to dispersed, socially constructed knowledge and shared insights is achieved through teamwork: 'I have access to your knowledge because we collaborate.' On-going knowledge-building is a social project; this implies that areas of expertise benefit from strategies that acknowledge their specific processes whilst striving to network to the 'bigger picture'. The involvement of students in the inherent challenges presented by this endeavour and the efforts made to address such challenges are essential to the evolution of critical thinking in all domains of work and in the research that supports them.

Research endeavours that strive to tackle systemic societal and global challenges are moreover expected to integrate varied disciplinary perspectives and methodological dimensions. Such integration and emergence of research activities can be supported by pedagogical practices and curricula designed to transcend standard boundaries.

The challenge for many established universities is often the lack of agility and adaptation to rapidly changing circumstances in societies. Old structures are generally not flexible enough to support emerging interdisciplinary pedagogic entities. Bridging faculties and disciplines requires both a specific pedagogic approach and appropriate administrative support. The combination of top-down and grassroots-up approaches is a prerequisite for establishing and sustaining academic structures for interdisciplinary and cross-boundary research and education. Interaction between disciplinary silos can benefit from an attitude of 'thinking in-between', or 'living on the bridge'. Finding the thresholds, hinges, and friction points between disciplines are the practicalities of collaboration.[1]

CONTEXTUAL EXPERTISE

Contemporary societies depend on the expertise of individuals in various fields and disciplines. As the challenges of inhabiting the planet with limited resources multiply, the problems are becoming more and more complicated. We can no longer solve them simply by involving one or two experts, rather than a team of them. As the disciplines dive deeper into their respective areas of knowledge, the need for expertise continues to increase. However, experts themselves will no longer be able to work alone in the context of problems that are becoming ever broader in nature. The capacity of individual experts to position their skills and knowledge in relation to shareable conceptions of 'the bigger picture' is a distinctive characteristic of sustained interdisciplinary practices. Understanding the roles of particular disciplines in a specific context and the changes they bring to the understanding of complex systems will thus become even more important.

ARTISTIC GROUP INTELLIGENCE AND SOCIAL CONSCIOUSNESS

A team of experts, at its best, is more than the sum of its components. If the individuals learn to assimilate their own role in relation to other members of the team, the dynamics of the group are likely to produce interesting and effective thinking. Knowledge building is a shared endeavour, stemming from respect and positive dependence amongst group members. When free of hierarchies, the group has the capacity to think as one entity.

The diversity of disciplines at universities generates unique potentials for facilitating and enhancing the emergence of group intelligence, parallel to none. Taking advantage of this is a pedagogical challenge that is urgent for our time. Broad-based thinking is a great asset when students, the 'thinkers of tomorrow', leave the university to become active members of society. A cross-disciplinary mindset also provides them with the capability to identify the issues in society that need addressing, not only on a technical level, but also on the level of social justice and equality, which makes it necessary to develop strategic thinking further.

INTERDISCIPLINARY UNIVERSITY PROGRAMMES

Multi- and interdisciplinary education is currently being widely discussed and promoted in the academic world.[2] Several interdisciplinary programmes are being created and new curricula are being shaped. Multidisciplinarity has come to resemble a mantra, repeated excessively, sometimes without a closer look being taken at the most appropriate pedagogical approaches,

implementations, and benefits. The terms multi-, inter-, and transdisciplinarity are used arbitrarily, without a closer look being taken at the theoretical framework or the vast literature on the topic that is commonly accepted by interdisciplinarians. Some critics, such as Jeffrey Wasserstrom,[3] even argue that interdisciplinarity has become so 'fuzzy' that universities' commitment to it is close to meaningless. Undoubtedly, this stems from the fact that the challenges and complex problems of our time desperately call for greater collaboration and the integration of insights, knowledge, and disciplinary practices. For example, the questions related to development in the world majority context (i.e. the Third World or developing countries) are broad in nature and cannot be addressed by one single or just a few areas of expertise. The same applies to the environmental and climatic challenges we are currently facing.[4] Contemporary problems cannot be solved with the instrumentalities of the past; the integration of disciplines and new forms of knowledge creation is thus needed.[5]

Interdisciplinarity must be incorporated into the fundamental thinking of curricula design as well as the research agendas of contemporary academia. But one question still remains: How can the disciplines be bridged in such a way that new insights and understanding are generated, rather than merely mandatory, superficially fulfilling curricula requirements?

In academia, where the segregation and ever-deepening expertise of disciplines over decades has produced a siloed structure of faculties and departments, it is difficult to overcome the commonly accepted and customary modus operandi. The division of the scientific community into ever smaller units as a result of the expansion of expertise has given rise to a new type of challenge: How can an understanding of the relations between diversifying types of knowledge and their sharable insights be produced? Stepping away from the ordinary and looking and reaching for the 'big picture' to see how things connect, finding new ways of working, and taking the trouble to do things in a different way are, however, time-consuming and laborious.

The same processes of the mind are present and applicable in research processes, amplified by the internalized deep knowledge and expertise of the researchers. Identifying the entry points and shaping a common language for sharing and building a common pool of information for refined, in-depth knowledge is equally demanding.

DEFINITIONS OF INTERDISCIPLINARITY

The terms multi-, inter-, and transdisciplinarity are often confused and the terminology lacks clarity. A literature review provides various and extensive definitions of the differences between the terms. Since 1979, the Association of Interdisciplinary Studies (AIS) at Oakland University in Michigan has promoted the interchange of ideas among scholars and administrators so as to further integrative study.[6] AIS's publication *Issues in Interdisciplinary Studies* as well as AIS's annual conferences have become important forums for contemporary knowledge creation and sharing for interdisciplinarians. The literature also provides useful definitions of the terminology commonly used.

Allen Repko[7] views multidisciplinary as proximity, as placing two or more disciplines side by side, such as inviting teachers from different departments to explain their particular discipline's perspective on the topic of a course in a serial manner, but without necessarily intertwining or integrating their insights. It uses the knowledge understanding of more than one discipline, without necessary allowing for integration.[8] Repko argues: 'Merely bringing the different disciplines together in some way but failing to engage in the hard work of integration is multidisciplinary studies, not interdisciplinary studies.'[9]

Interdisciplinarity uses the epistemology methods of one discipline within another.[10] It draws on the perspectives of more than one discipline in order to synthesize a more comprehensive understanding.[11] As early as 1997, Klein and Newell provided what has served as the basis for definitions of interdisciplinarity: 'Interdisciplinary studies may be defined as a process of answering a question, solving a problem, or addressing a topic that is too broad or complex to be dealt with adequately by a single discipline or profession.'[12]

Multidisciplinarity is entirely subsumed within interdisciplinarity; it is a necessary but insufficient condition for interdisciplinarity.[13] *Interdisciplinary* or *integrative studies* occur when teachers go beyond establishing a common meeting place for solving problems, and also develop new methods and theory crafted to transcend disciplines.[14] Organizing interdisciplinary curricula requires an understanding of certain aspects of the basic elements of human behaviour in relation to teamwork, knowledge creation, and social systems. It is an extremely demanding form of education, which can also

have detrimental effects if not properly designed and facilitated. According to Repko, the basic requirements of an interdisciplinary course include:

1. addressing a complex problem or focus question that cannot be resolved using one single disciplinary approach,
2. drawing on insights generated by disciplines, inter-disciplines, or schools of thought, including nondisciplinary knowledge formations,
3. adhering to an integrative process, and
4. producing an interdisciplinary understanding of the problem or question.[15]

Boix Mansilla, Miller, and Gardner claim that students demonstrate interdisciplinary understanding '… when they integrate knowledge and modes of thinking from two or more disciplines in order to create products, solve problems, and offer explanations of the world around them.'[16] The common misapprehension is that inter-disciplinary interaction occurs when students

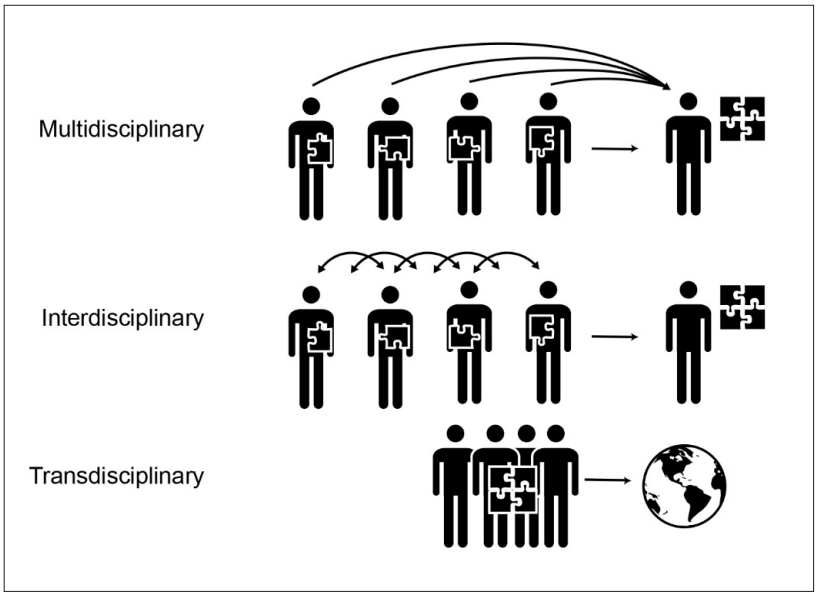


Figure 1. Definitions of Multi-/Inter-/Transdisciplinarity. Image by Tannan Whidden Winter.

of different disciplines are put to work on a problem together. If professionals working in the field already find this challenging, it is not likely to be any less demanding for students, who are still refining their professional skills. The challenging task for the teacher is to facilitate the interaction: Interdisciplinary collaboration does not happen by itself. It requires active engagement and a 'crafting of opportunities' for students to find out for themselves what other students already know, as well as recognizing how one's own knowledge can contribute to the task at hand and how these strands of knowledge are woven together to generate new thinking.

Transdisciplinarity is said to be a meta-level approach to interdisciplinarity, which involves multiple disciplines *and* the space between the disciplines, *with* the possibility of new perspectives 'beyond' those disciplines.[17] It engages students in examining real-world problems by making use of several disciplines and discovering the nondisciplinary and emerging knowledge '*in-between*' disciplines. At its best, teacher-facilitated interdisciplinary collaboration has the potential to surpass expectations and explore the knowledge found in between established fields, thus giving rise to authentic innovations.

COMPLEX SYSTEMS IN INTERDISCIPLINARY PEDAGOGY

Interdisciplinarity is frequently paired with complexity. In his article 'A Theory of Interdisciplinary Studies', Newell contends: '… complex systems and phenomena are a necessary condition for interdisciplinary studies'.[18] Hence, as noted by Repko as well, complexity can be regarded as a keyword in the contemporary description of interdisciplinarity.[19] An interdisciplinary course explores a problem that cannot be addressed by one single disciplinary approach, nor by using two side by side or in a sequenced manner—that is to say, a problem that is essentially complex by nature. By default, an interdisciplinary course requires a challenge that facilitates and calls for not only the integration of various perspectives, but also holistic thinking and a possibility for innovative knowledge creation. Repko argues: '…whereas perspective taking is the ability to understand how each discipline would typically view the problem, holistic thinking is the ability to see the entire problem in relation to its constituent disciplinary parts'.[20]

A system is a set of nonlinear relations of separate facets of a problem. Newell claims: '… a complex system is composed of components actively connected through predominantly nonlinear relationships'.[21] Viewed from one discipli-

nary vantage point, the components of a system appear differently than when seen from another perspective. Furthermore, a system changes as the relationships between its components evolve. Newell asserts: 'All systems … are made up of components that interact … Because of those interaction effects, the system as a whole is more than the sum of its parts; indeed, it is different from the sum of its parts.'[22] The pedagogical challenge in an interdisciplinary course dealing with complex systems is to sense the emerging relations and undefined connections and to allow them to evolve freely, with the aim of structuring the course in a meaningful way.

As is commonly agreed by interdisciplinarians, interdisciplinary courses that operate within the framework of a complex system become a process rather than a product. Newell discusses the nonlinearity of this interdisciplinary process: 'Integration necessitates working backwards from the phenomenon and forward from the sub-systems studied by different disciplines. That integrative process is anything but linear.'[23] The nonlinearity and indeterminacy of human behaviour as a complex system are a challenge for education and force the faculty to engage in constant debates about the didactics of the issues being taught and the planning of education.

Klein, on the other hand, presents a somewhat linear approach to interdisciplinary steps.[24] Although useful in the natural sciences and applicable in the humanities, since they take into account the nature and essence of arts, design, and architecture, interdisciplinary processes, involving these disciplines can hardly be defined as linear, but instead as cyclical, iterative, self-sustaining, and dynamic. New combinations affect and generate nonlinear relations within and between systems, thus producing novel perspectives and unforeseen situations. Each combination produces a different setting and network of relations. The pedagogy arising from these relations needs to accustom itself to the prevailing and constantly changing settings.

COMMUNITIES OF PRACTICE AND SITUATED LEARNING IN INTERDISCIPLINARY STUDIES

Architectural education in Finland is known for its pragmatic approach to teaching. Strong emphasis is traditionally put on practical matters—students are taught to design buildings, cities, and land use, and to understand historical values and restoration. In a traditional design studio, learning often takes place within the framework of a course that simulates reality: Course materials include a real site, a programme, and a 'client'. The students learn the

basics of a design process by trial and error; 'learning by doing' is a commonly used teaching strategy, appreciated by many.

'Learning by doing' has a strong connection to situated learning theory and the idea of a community of practice.[25] Situated learning theory implies that *learning* means becoming a member of a community of practitioners, and *knowledge* is the ability to participate in a community of practice. Action is situated because it is constrained by a person's understanding of their 'place' in a social process.[26] Lave suggests: '… [C]onsider learning as a process of becoming a member of a sustained community of practice'.[27]

To teach is to change the social system in which an activity occurs. In interdisciplinary studies, the representations in communities of practice are questioned, as the social systems of a certain community of practice do not necessarily retain their validity in a new set of nonlinear relations. A new system and a new community of practice and practitioners are formed in interdisciplinary interaction. Clancey mentions that the strongest effect is not in 'how to teach', but in 'how to change' a social system.[28] Holistic thinking and an interdisciplinary integration of perspectives transform the social systems of communities of practice. Learning in interdisciplinary studies is situated because it stems from the activity that takes place in the changing social system and interacting in a new community of expertise and practitioners.

In university education, students quickly learn to adapt to the conventions of their particular community. Participating means being familiar with the conventions of a particular society, and, as a social system, every society has its own representations of actions, which become internalized by its members. This in turn sustains the division between disciplinary communities. Creating interdisciplinary programmes is challenging due to the differences in behaviour between established communities of practice in the university context.

THE CHALLENGES OF TEAMWORK

Teamwork is generally regarded as a form of learning that enhances mutual understanding and engages individuals in a process that is more productive than an individual project on its own might produce. In their article on teamwork, Gavriel Salomon and Tamar Globerson confirm that studies show: 'Generally speaking, teamwork affords the externalization of thought

processes, the comparison of alternative perspectives, social facilitation and socially monitored attentiveness to the task.'[29]

But because there are social-psychological effects that can impair team performance, this is not always the case. While educators are generally aware that teamwork presents challenges and does not always function in an ideal manner, literature showing this is nonetheless scarce. Salomon and Globerson assert:

> A team is a social system, and as such it is a qualitatively different entity than a few individuals working alone side-by-side. Behaviours and cognitions in the group have two major characteristics: they become interdependent and this interdependence develops over time in a reciprocal manner. This developing interdependence implies that individuals' cognitive processes affect and become affected by the ones of the other team members … Such social cognitions both affect the social interaction and result from it.[30]

Like human behaviour in general, the emerging team interdependencies are unpredictable and unforeseen to some extent. At its best, the performance of a team becomes more than could be achieved by the individuals on their own. At its worst, teamwork can have negative, even disastrous effects on the learning, motivation, performance, and commitment of team members. Salomon and Globerson list some of the detrimental effects of teamwork[31]:

1. The 'Free Rider' Effect
If one member of a team is particularly talented and hardworking, other members of the team can easily cede responsibility for tasks to this person, who would perform well in any case, and thus take on the role of a 'free rider'. The 'free rider' effect can also develop in connection with tasks that depend on the least able member when the more able one feels unmotivated. The effect is best avoided in additive tasks, where team performance depends on the contribution of all its members to an equal extent.

2. The 'Sucker' Effect
If a talented member of a group feels that their abilities are being exploited, they may become frustrated about being taken advantage of. As a result,

both the talented and the exploitative members lose their motivation to work on the task at hand.

3. Status Differential Effects
According to Dembo and McAuliffe,[32] group members regarded as having a higher social status tend to dominate group activity and are more likely to receive and give help than members with lower social status. They affect the group's final solution more than their fellow group members by gaining additional social influence within the group. In such conditions, the team's optimal learning potential is not achieved.

4. 'Ganging up on the Task'
On some occasions, the group starts to do its utmost to avoid the given task and uses an excessive amount of energy to do the least possible amount of work merely in order to pass. If a member of the team is willing to put an extra amount of work into the task, the effort is welcomed, but no help will be provided by the other members.

Other effects, like systematic segregation of tasks (when someone always does the typing, someone always does the graphics, etc.) can occur if the team works together for a sufficiently long period of time. Competition between team members or teacher dependency can also have negative effects on group work.

In addition to listing the detrimental effects, Salomon and Globerson[33] also present several factors that can help avoid the negative effects mentioned above. Competition between groups—intergroup rather than intragroup—is one, while another is group dependence, where the task requires complementary components from different groups. Task-related interdependencies among team members seem to be the best motivators for engaging in the task.

In general, it seems that, in teamwork, the best results are achieved when the given task is additive in nature. To engage all the members of the team, the collaboration needs to be designed in such a way that all members become indispensable, regardless of their social status, leadership abilities, or individual talents. In a cross-disciplinary course setting, the members of the team possess expertise, skills, or abilities that the others do not have. This gives rise to a framework in which all members can contribute and be part of joint

knowledge creation as equal team members. In order to make the contributions of all members valid and simultaneous, the task needs to be engaging and to allow all group members to participate at all stages of the task.

BRIDGING DISCIPLINES AT THE UNIVERSITY

Forming a new pedagogy that addresses the various needs and approaches to teaching different contents and subjects makes it necessary to combine various didactic practices. Planning multidisciplinary university programmes involves several levels and layers where the objectives and outcomes of this new pedagogy need to be defined.

The challenge of an interdisciplinary programme is safeguarding the growth, deepening, and maturing of students' expertise in the discipline they consider

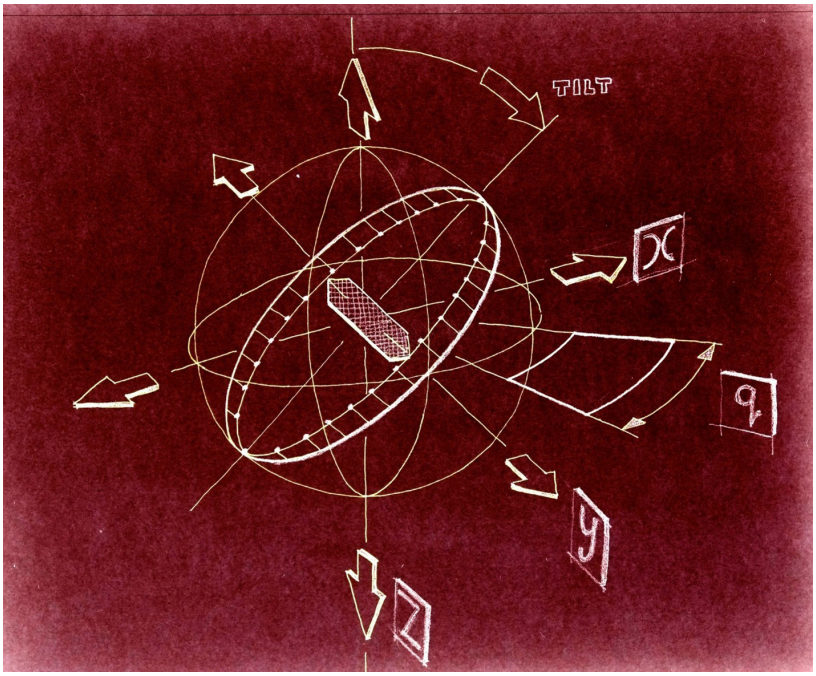


Figure 2. Image by Christopher Rose

their own. Thus, as much as communication and integrative collaboration between disciplines is necessary, it is also important that special knowhow and penetrating expertise are not compromised either; that sufficient discipline-oriented education is still provided. As essential as interdisciplinary interaction and holistic thinking are, separate fields of education nonetheless still form the basis for growth in deepened expertise. At the same time, exploring the relations between disciplines already in undergraduate education enables students to comprehend the 'big picture' of our time, with all its nonlinear relations and complex, evolving systems. Such practices are helpful when we aim to establish interdisciplinary research projects that stem from various knowledge foundations.

What the best contemporary practices of inter-disciplinary, or *in-between-pedagogy*, have in common is that they are not constituted merely by combining existing curriculum components, but rather by forming new combinations so as to start with a fresh approach.[34] These new insights include teamwork skills, situated learning skills and experience, contextualized expertise, and an understanding of nondisciplinary knowledge creation. With these components, as well as ones yet to come, we can anticipate new measures for interdisciplinary studies and research to arise.

CONDITIONS FOR CREATIVE THINKING AT UNIVERSITIES

In the previous section, I discussed the conditions and challenges of interdisciplinary education, teamwork, and curriculum design when bridging disciplines. The elusive nature of interpersonal relations makes the nonlinear processes of inter- and cross-disciplinary programmes unpredictable.

The access and entry points to the *in-between* areas of disciplines are difficult to identify—albeit both are necessary in the pursuit of genuinely inter- and transdisciplinary education. Artistic processes provide one possible approach to addressing the transformation of disciplinary and pedagogical thinking by linking diversified dimensions of knowledge and understanding stemming from various cultural origins. They provide education and research that connects rather than divides. Holistic thinking, interdisciplinary education and research linked to deep expertise, and creativity understood as a human capacity—all of these are useful elements and building blocks in a higher education system that aims to educate future generations who will shape both a more resilient planet and sustainable ways of living.

In the pursuit of new instruments for holistic thinking[35] and nontrivial relations between disciplines, it is useful to promote new ways of thinking about how to access the creative processes of the human mind and to develop pedagogies for achieving this in the context of multidisciplinary institutions of higher education. The objective is to enhance understanding of the relations between diversifying types of knowledge and their sharable insights and to find entry points to those *in-between* areas across disciplines. Creative processes serve as a means for us to become autonomous thinkers and enable us to break us out of constraining boundaries,[36] to gain the ability to dwell in the uncertain and to maintain our capacity for lifelong and life-wide learning.

The qualities and dispositions described in the paragraphs that follow serve as vehicles and access points to such processes, and provide connections across cultural conditions.

THE ROLE OF ART AND CREATIVITY

Art, as such, is not *useful* in the utilitarian meaning of the word. For an artist, art as such is purposeless.[37] The meaning of art is to engage us in the quest for the essence of humanity, to connect us with our most profound experiences of what it means to be human.

The arts can nonetheless also be applied in a useful manner. Design professions make use of and apply artistic processes and interaction by redefining and reframing our practices. Design can help us to interpret the world in ways that lead to new actions.[38] The arts take us out of our heads and into our bodies, hearts, and souls in ways that enable us to connect more deeply with ourselves and others.[39] Art is the expression of our cultures, connecting us with the trajectories of time across communities and individual aspirations.

Creativity, however, is not a prisoner of art.[40] It is a human capacity that we all possess. A child is capable of divergent thinking and learns through questioning and wonder. We tend to lose some of that capacity as we enter the systematic machineries of education and societal pressure. Nevertheless, creativity remains a quality that we all have, albeit some individuals more prominently than others. It is a quality that can be cultivated, learned, and furthered in every individual and community. Creativity is an attitude, like a skin that cannot be sloughed off once adopted.[41]

Artistic and creative processes are conditions inherently marked by uncertainty and not-knowing. When we engage in an undefined and unpredictable process of doing, sharing, and experimenting, it is impossible for us to know where the process will lead us. Creative processes are nonlinear and iterative, and new directions and perspectives emerge as processes evolve. Taking new and unexpected paths and venturing out of one's comfort zone into areas where personal engagement and risk-taking are required takes courage. A creative process may lead to unexpected results, but failure should also be embraced and celebrated as a major achievement and opportunity, as an inevitable component of risk-taking, and as a prerequisite for learning and future innovation.[42]

Figure 3. Artwork by Antti Huittinen.[43] Photo: Anne Kinnunen

NONDISCIPLINARY KNOWLEDGE CREATION

Nondisciplinary knowledge creation occurs in situations and relations between individuals. It is sensory, tactile, visual, or auditory and informs our intuition about the specific directions a project needs to take. In group work, such knowledge is the glue that helps bind teams together and allows for mutual trust to grow between members of a team.

The hermeneutics of complex knowledge creation involves embodied cognition to the same extent as intellectual and scientific rationale. Sociologists speak of 'embodied', 'distributed', and 'situated' cognition as different types of knowledge formation to be appreciated. Knowledge creation is a cyclic and iterative process. In creative scientific and artistic processes alike, new relations between varying threads of knowledge emerge—the sort of tacit knowledge inherent in excellence and expertise.

In a logical system, every relation has to make sense, whereas creative and artistic thinking is based on not-knowing and incomprehensibility.[44] It explores how experience transforms into knowledge. Creative thinking is a human quality that can be relearned and cultivated—not as an additional component, but as an attitude that profoundly affects our ways of working.[45]

Knowledge-building in creative processes can be characterized as cyclic, iterative, self-sustaining, and dynamic. This includes bridging disciplines in such a way that new insights and understanding may emerge. New combinations affect and give rise to nonlinear relations within and between systems, generating novel perspectives and unforeseen situations. Making unprecedented syntheses is what makes us the species we are. Each combination produces a different setting and network of relations. The pedagogies arising from these relations need to accustom themselves to the prevailing and constantly changing settings.

The arts—or rather the artistic attitude in general—play an integral part in forming an understanding of nondisciplinary knowledge creation and the interdependencies of the mind. Exploring such intuitive and nonlinear processes is equally beneficial for scientific research. Exploiting various modes of sensory thinking, doing, making, and experimenting can help us position and reposition ourselves in the world.[46] Allowing these realms to collide—facilitating movement between the conscious and unconscious dimensions of knowledge—has the potential to augment our capacity to understand the world.

LEARNING AS A TRANSFORMATIVE EXPERIENCE

Engaging in a creative process may require us to confront a 'disorienting dilemma' that forces us to confront our otherwise tacit ways of thinking and thus become aware of them. This can lead to a process of reflecting critically on one's own experiences, assumptions, beliefs, feelings, and mental perspectives in order to construct new or revised interpretations of the world. Learning can therefore become a transformative experience, resulting in a deep shift in perspective, in which our habits of mind become more open and justified. This can only happen voluntarily through discourse and active communication with other learners.[47] The arts possess the capacity to transform our individual and collective worldviews and to help us connect with others and ourselves more deeply.

To become critically reflective of one's own assumptions facilitates the process of becoming an *autonomous thinker*. It is the key to transforming people's taken-for-granted frames of reference, meaning perspectives, and habits of mind.[48]

Dispositions that enable us to progress forwards in the process of learning, such as curiosity, the will to learn, to engage, and the preparedness to explore, are just as important. Qualities such as *courage*, *resilience*, *self-discipline*, *integrity*, and *criticality* colour, give 'character' to that forwards movement of becoming autonomous thinkers. To as great an extent as lifelong learning, transformative learning also involves life-wide learning, which facilitates learning across one's life experiences.[49]

Emotional dimensions constitute an integral part of humanity and our individual personalities. Learning is also an emotional process.[50] Emotions—referred to here not as something uncritical or as romanticized sentimentality, but as an inherent part of our human existence—may provide a powerful vehicle and an access point to the creative and intuitive, tacit and unconscious processes of the mind. Becoming connected with one's own intuitive and emotional capacities is a path to nondisciplinary knowledge creation and embodied cognition of the hidden dimensions of our learning experiences.

Individual and collective knowledge, taken-for-granted 'truths', and canonized theories or practices may become obstructions in the search for new ways of working.[51] Becoming aware of and unlearning those habits of mind, as well as embodied habits of working that hinder us in coming up with new

ways of thinking, is thus of critical importance. This involves both individual and collective questioning and a reframing of the prevailing conditions. Unlearning gives way to relearning and working towards new interpretations and relations between multiple forms of knowledge creation. Unlearning signifies moving away from ordinary structures and habits of working so as to provide space for new kinds of processes to emerge.

THINKING BEYOND DISCIPLINARY BOUNDARIES

Interdisciplinary studies may be described as the process, rather than the product, of addressing a topic that is too broad or complex to be dealt with by one single discipline or profession.[52] Interaction between what were formerly

Figure 4. Artwork by Anu Koponen. Photo: Anne Kinnunen

disciplinary silos calls for an attitude of 'thinking in between', or 'living on the bridge'. Leaving one's comfort zone and identifying the thresholds, hinges, and friction points between disciplines are the practicalities of collaboration.[53]

Disciplines are products of their particular time and cultures, not indispensable constants in their own right.[54] The irresolvable super-complexities that surround us[55] are hence best addressed by abandoning the prevailing disciplinary boundaries and developing attitudes that allow us to transcend them effectively.

Learning in interdisciplinary studies is situated in that it stems from the activity that takes place in the changing social system and in the interaction of a new community of expertise and practitioners. In interdisciplinary studies, the social systems of a particular community of practice are questioned in a new set of nonlinear relations. A new system, a new community of practice and practitioners, is formed through interdisciplinary interaction.[56]

Transdisciplinarity means we no longer superimpose meanings or elements on top of each other, but rather allow them to merge into new entities of meaning. Interdisciplinary collaboration requires active engagement, from both students and teachers alike, as well as a 'crafting of opportunities', where the students can find out for themselves what others know, how one's own knowledge can contribute to the task at hand, and how these threads of knowledge are woven together to generate new thinking.[57]

Knowledge has become a shared possession between individuals and people in groups. Students in higher education are adults who all possess a unique body of knowledge, experiences, and skills. Collaboration requires that the base of experience of all learners be acknowledged and appreciated, since continued knowledge-building is a social project. The focus is on communication and interpersonal skills, which enable us to connect with others, to share and exploit the collective and individual knowledge bases that become available through teamwork.[58]

Language actively forms and structures our understanding of the world. The meaning of words referring to objects or subjects in one discipline may have even reversed connotations in another. Language is not used in isolation: In the processes of becoming aware of the ways in which diverse knowledge

creation collide, we must recognize that the use of language is inadequate and insufficient. Artistic processes make it possible for us to transcend linguistic barriers and connotations and to come up with new meaningful expressions for contemporary phenomena.[59]

The need for collaboration and co-creation when working on contemporary challenges also foregrounds the question of authorship. The Western idea of the single creator-mind who can claim ownership of an idea, product, or work of art is fundamentally outdated in the context of co-creative communities.[60] Promoting the teaching of creative processes in an interdisciplinary higher education context makes is necessary to abandon the idea of solo authorship and to focus on the creative potential of the collaborative and interpersonal dimensions of knowledge creation processes. Design approaches can serve as facilitators in such co-creative processes.

Figure 5. Artwork by Sari Kivimäki. Photo: Anne Kinnunen

There are many successful examples of nontrivial relations and discoveries between art and science.[61] The praxis has in fact existed for centuries: We have artists, projects, and art communities that work with scientists, engineers, and economists on creating artworks that exploit scientific methods and techniques. We have scientists who engage in artistic processes to produce wonderful artworks that connect across cultural interpretations. There is no doubt that these practices are of value and provide insights for a larger audience.[62]

However, in an institution of higher education with a multidisciplinary infrastructure that has the capacity to connect across disciplines, relying on the praxes of a few does not suffice. We instead need strategies that can incorporate creative thinking in the very core of our education and research activities—across disciplines and cultural conditions. By exploring and exploiting creative methods and practices, we can cultivate creative and critical thinking as an attitude that will allow us to embrace new and emerging ways of viewing the world that are free of prejudice and connected in their diversity.

CONCLUDING REMARKS

An open mind allows us to become a poet in our own discipline: The nuances and spectrum of life become a part of how we reflect on and view the world. Fostering creative processes in any disciplinary learning environment enhances the possibilities for finding new, unpredicted strategies for future problems that our generation cannot foresee.

Engaging in an interdisciplinary process so as to consciously dwell in the *in-between* of disciplines is a courageous act that requires a willingness to change prevailing ways of working and seeing the world. It is a way to produce new interpretations and nonlinear combinations between the diversifying types of knowledge within and between systems and to arrive at novel and unforeseen perspectives. New instrumentalities for experiencing the world can emerge in the interaction of the processes of various knowledge bases: Connecting to one's nondisciplinary intuition can enable such relations to unfold in a meaningful way.

NOTES

[1] See S. Hollmén and C. Rose, *ARTS + ENG: Future Collaborative Academic Models at Aalto* (Espoo, Finland, 2013).

[2] See S. Hollmén, 'The Pedagogical Challenge of Interdisciplinary University Programs', in *SYNNYT/ORIGINS*, 2 (2015), pp. 1–14.

[3] J. N. Wasserstrom, 'Expanding on the I-Word', *The Chronicle of Higher Education*, 52/20 (2006), p. B.5.

[4] See S. Hollmén, T. Laurila, and M. Muhionen, 'World in Transition—A Strategy for Multi-disciplinary Pedagogy in Different Cultural Environments', in *Architecture Otherwhere*, pp. 1600–9, presented at the XXV International Union of Architects World Congress, Durban UIA Durban, 2014.

[5] See Hollmén and Rose, *ARTS + ENG: Future Collaborative Academic Models at Aalto*.

[6] See 'Association for Interdisciplinary Studies', https://interdisciplinarystudies.org/ [all web pages here accessed in November 2020].

[7] A. F. Repko, 'Interdisciplinary curriculum design', *Academic Exchange Quarterly*, 11/1 (2007), p. 130.

[8] See R. Ibrahim, R. Fruchter, and R. Sharif, 'FRAMEWORK FOR A CROSS-BORDER TRANSDISCIPLINARY DESIGN EDUCATION', *Archnet/IJAR*, 1/3 (2007), pp. 88–100.

[9] Repko, 'Interdisciplinary curriculum design', p. 133.

[10] See Ibrahim et al., 'FRAMEWORK FOR A CROSS-BORDER TRANSDISCIPLINARY DESIGN EDUCATION'.

[11] See W. H. Newell, 'Six Arguments for Agreeing on a Definition of Interdisciplinary Studies', *AIS Newslettter*, 29 (2007).

[12] J. T. Klein, and W. H. Newell, 'Advancing Interdisciplinary Studies', in *Handbook of the Undergraduate Curriculum: A Comprehensive Guide to the Purposes, Structures, Practices, and Change*. Jossey-Bass Higher and Adult Education Series, vol. 1, ed. J. G. Gaff (San Francisco, CA: Jossey-Bass Publishers, 1997), p. 393.

[13] See Newell, 'Six Arguments for Agreeing on a Definition of Interdisciplinary Studies'.

[14] See W. H. Newell, 'A Theory of Interdisciplinary Studies', *Issues in Integrative Studies*, 19/1 (2001), pp. 1–25; and Repko, 'Interdisciplinary curriculum design'.

[15] Repko, 'Interdisciplinary curriculum design', p. 131.

[16] V. Boix Mansilla, W. C. Miller, and H. Gardner, 'On disciplinary lenses and interdisciplinary work', in *Interdisciplinary Curriculum—Challenges to Implementation*, vol. 1, ed. S. Wineburg and P. Gossman (New York: Teachers College, Columbia University, 2002), pp. 17–38, esp. pp. 17–18.

[17] Ibrahim et al., 'FRAMEWORK FOR A CROSS-BORDER TRANSDISCIPLINARY DESIGN EDUCATION', pp. 91–92.

[18] W. H. Newell, 'A Theory of Interdisciplinary Studies', *Issues in Integrative Studies,* 19/1 (2001), pp. 1–25, esp. p. 1.

[19] See Repko, 'Interdisciplinary curriculum design'.

[20] Repko, 'Interdisciplinary curriculum design', p. 134.

[21] Newell, 'A Theory of Interdisciplinary Studies', p. 9.

[22] Newell, 'A Theory of Interdisciplinary Studies', p. 7.

[23] Newell, 'A Theory of Interdisciplinary Studies', p. 20.

[24] See J. T. Klein, 'Mapping Interdisciplinary Studies: The Academy in Transition', in *Undefined* (Washington, D.C.: Association of American Colleges & Universities, 1999), pp. 1–37.

[25] E. Wenger, *Communities of Practice: Learning, Meaning, and Identity* (Cambridge: Cambridge University Press, 1998), pp. xv, 318.

[26] See W. J. Clancey, 'A Tutorial on Situated Learning', in *International Conference on Computers and Education* (Charlottesville, VA: AACE Taiwan, 1995), pp. 49–70.

[27] See J. Lave, 'Situating learning in communities of practice', in *Perspectives on Socially Shared Cognition*, vol. 1, ed. L. B. Resnick, J. M. Levine, and S. D. Teasley (Washington, D.C.: American Psychological Association, 1991), pp. 63–82.

[28] See Clancey, 'A Tutorial on Situated Learning'.

[29] J. Lave, 'Situating learning in communities of practice', p. 90.

[30] See G. Salomon, and T. Globerson, 'When teams do not function the way they ought to', *International Journal of Educational Research*, 13/1 (1989), pp. 89–99, esp. pp. 94–9, DOI: 10.1016/0883-0355(89)90018-9.

[31] Ibid., p. 93.

[32] See M. H. Dembo, and T. J. Mcauliffe 'Effects of Perceived Ability and Grade Status on Social Interaction and Influence in Cooperative Groups', *Journal of Educational Psychology* 79/4 (1987), pp. 415–23, https://doi.org/10.1037/0022-0663.79.4.415.

[33] See Salomon and Globerson, 'When teams do not function the way they ought to'.

[34] See Hollmén and Rose, *ARTS + ENG*.

[35] '… holistic thinking is the ability to see the entire problem in relation to its constituent disciplinary parts', in Repko, 'Interdisciplinary curriculum design', p. 134.

[36] See R. L. Lawrence, 'Transformative Learning Through Artistic Expression: Getting Out of Our Heads', in *The Handbook of Transformative Learning: Theory, Research, and Practice*, 1st edn., vols. 1–29, ed. E. W. Taylor and P. Cranton (San Francisco: Jossey-Bass, 2012), p. verkko-aineisto (xiv).

[37] Comment by Mathew Wilson at 'U-Create Seminar on Creativity 2019', Aalto University, Espoo, Finland, 29 November 2019.

[38] K. Dorst, *Notes on Design: How Creative Practice Works* (Amsterdam, The Netherlands: BIS Publishers, 2017), p. 10.

[39] Lawrence, 'Transformative Learning Through Artistic Expression', p. 471.

[40] See U. Bertram, 'Is Christmas already over? About artistic thinking in non-artistic fields: Keynote in U-Create Seminar on Creativity 2019', presented at the U-Create Seminar on Creativity 2019, 29 November 2019, Aalto University, Espoo, Finland.

[41] Bertram, 'Is Christmas already over?'.

[42] See Hollmén and Rose, *ARTS + ENG*.

[43] Artworks: Pedagogical Encounters—an educational development research project at ARTS (Nuutinen and Löytönen, AoF, 2012–15).

[44] See N. Shah, 'The unbearable cleanliness of creativity: Keynote in U-Create Seminar on Creativity 2019', presented at the U-Create Seminar on Creativity 2019, Aalto University, Espoo, Finland.

[45] See Bertram, 'Is Christmas already over?'; C. 1, Taiteiden ja suunnittelun korkeakoulu, School of Arts, D. and A., Muotoilun laitos, Department of Design, Prof. M. Mäkelä, Aalto University, Department of Design, Finland, and Prof. P. Seitamaa-Hakkarainen, University of Helsinki, Finland, et al., *Making Sense Through Hands: Design and Craft Practice Analysed as Embodied Cognition* (Espoo, Finland: Aalto University, 2017); K. Kosonen, and M. Mäkelä, 'Designing Platform for Exploring and Reflecting on Creative Process', *Procedia—Social and Behavioral Sciences*, 45/C (2012), pp. 227–38, https://doi.org/10.1016/j.sbspro.2012.06.559; and M. Mäkelä and T. Löytönen, 'Rethinking materialities in higher education', *Art, Design and Communication in Higher Education*, 16/2 (2017), pp. 227–38, https://doi.org/10.1386/adch.16.2.241_1.

[46] See Hollmén, 'The Pedagogical Challenge of Interdisciplinary University Programs'.

[47] See P. Cranton and E. W. Taylor, 'Transformative Learning', in *The Routledge International Handbook of Learning*, vol. 1, ed. Jarvis Pe (London: Routledge, 2011), https://doi.org/10.4324/9780203357385.

[48] See J. Mezirow, 'Transformative Learning: Theory to Practice', *New Directions for Adult and Continuing Education*, 74 (1997), pp. 5–12, https://doi.org/10.1002/ace.7401.

[49] See R. Barnett, 'Learning for an unknown future', *Higher Education Research & Development*, 31/1 (2012), pp. 65–77, https://doi.org/10.1080/07294360.2012.642841.

[50] See J. M. Dirkx, 'Engaging emotions in adult learning: A Jungian perspective on emotion and transformative learning', *New Directions for Adult and Continuing Education*, 109 (2006), pp. 15–26, https://doi.org/10.1002/ace.204.

[51] A. Krauss, 'Unlearning institutional habits: an arts-based perspective on organizational unlearning', *The Learning Organization*, 26/5 (2019), https://doi.org/10.1108/TLO-10-2018-0172.

[52] See Newell, 'A Theory of Interdisciplinary Studies'.

[53] See Hollmén and Rose, *ARTS + ENG*.

[54] See S. Mattern, 'The New School 2019 Orientation', 2019.

[55] See R. Barnett, 'University knowledge in an age of supercomplexity', *Higher Education*, 40/4 (2000), pp. 409–22.

[56] See Clancey, 'A Tutorial on Situated Learning'.

[57] See Hollmén, 'The Pedagogical Challenge of Interdisciplinary University Programs'.

[58] See D. Bridges, 'Transferable skills: A philosophical perspective', *Studies in Higher Education*, 18/1 (1993), pp. 43–51, https://doi.org/10.1080/03075079312331382448.

[59] See A.-F. Schmid, 'Invention, Fiction, Creation: Keynote in U-Create Seminar on Creativity 2019', presented at the U-Create Seminar on Creativity 2019, 29 November 2019, Aalto University, Espoo, Finland.

[60] See F. Cramer, 'Art Versus Design Versus Science—Overcoming a Problematic Western Legacy: Keynote in Poesis & Precision', presented at Poesis & Precision: Forum on Non-Trivial Relations between Arts, Design & Sciences, West Bund Shanghai FutureLab, 2019.

[61] See U. Bertram, *Artistic Transfer: Efficiency Through Unruly Thinking* (Bielefeld: Transcript Verlag, 2018), https://doi.org/10.14361/9783839446683.

[62] S. Zielinski, 'Potential Spaces for Art and Design Education on the Highest Level: Some Basic Ideas & Challenges on Artistic and Scientific Research: Keynote in Poesis & Precision', presented at Poesis & Precision: Forum on Non-Trivial Relations between Arts, Design & Sciences, Shanghai: West Bund Shanghai FutureLab, 2019.

WALKING THE LINE: EXPLORING A PERAMBULATORY RESEARCH PRACTICE

Matthew Ashton

ABSTRACT

In 1905 the Swedish geologist Gerard de Geer traced a line from south to north across the terrain of Stockholm, hoping to understand the chronology of events that transformed the landscape towards the end of the last ice age. Between 2020 and 2023 I retraced this line on foot, following the material and engaging in a situated exploration of a landscape in a state of constant transformation. This article aims to unpack the practice of walking as a creative mode of research, where the line—the corridor of extraction along the glacially-formed ridges of Stockholm and Uppsala—acts as a defined site of study from which to probe notions of extraction, material flows, land use, territorial transformations, and relations of entanglement. Walking as a creative, generative, and explorative practice becomes the mode from which to investigate what is actually happening on the ground, revealing the multiple entangled social, spatial, and temporal relations at play. This article explores how walking as a practice can constitute a particular method of research, capable of providing a situated point of view from which to observe, reflect upon, and understand the world, and provide an ethical means of imagining it otherwise.

KEYWORDS

extraction, walking, Anthropocene, artistic research

WALKING THE LINE: EXPLORING A PERAMBULATORY RESEARCH PRACTICE

> I stand at the end of the line, gazing out across a choppy Baltic Sea. Broken waves greet broken clouds, in a poignant grey symphony. The slim tongue of land I find myself upon gently arcs, before slipping beneath the water, whose constant yet varying rhythms have shaped and manipulated this landscape for millennia. Along the shoreline lie the scattered remains of a rich geologic archive—eroded fragments of limestone, granite, flint, diabase, gneiss and pegmatite—shimmering in lustrous hues of red, blue, black, pink and yellow, enlivened by the effects of sea spray and a light drizzle of rain. Scraggy thickets of sea buckhorn interrupt the otherwise stony ground, with bushels of ripe fluorescent berries clinging to their limbs like salmon roe. A lone woman in a military-green raincoat and knee-high Wellingtons slowly wanders along the water's edge, occasionally stooping to pick up a pebble—the only other visitor on this drizzly summer's day.
>
> Billudden, 4 August 2023

EVERYTHING FLOWS

On a summer morning in 1905 the renowned Swedish geologist Gerard De Geer set out with ten students from Stockholm University, and ten from Uppsala University, 'each of them to their special part of a line about 200 kilometres long, running past Stockholm and Uppsala through the Södermanland-Uppland peninsula, from the great Fennoskandian moraines at its southern end to the Dalälfven River to the north'.[1] Over the next four days the expedition team made detailed observations of laminated fluvio-glacial clay sediments at various points along this line, measuring the distances between the distinctive annual layers. As a student in 1878, De Geer had recognized the regularity of these bands of sediment while conducting fieldwork, noting their similarity to the annual rings of trees and speculated that they must also represent annual layers of accumulation.[2] Over the years that followed he conducted fieldwork at several sites around Stockholm, but it was not until 1904–05 that he attempted to prove his method of counting periodically laminated sediments at sections placed at regular intervals along a line could establish a geochronology of the end of the last ice age. It was

an undertaking that would reveal a precise timeline of the climatic changes and geomorphic processes that had moulded the territory surrounding Stockholm, and in subsequent years the entire Scandinavian Peninsula (see fig. 1).[3] De Geer read the earth as a vast territorial archive capable of recounting stories of past climatic upheavals, territorial transformations, and material flows. One simply had to pay attention to the clues left behind.

On a wet August day in 2023 I found myself at the end of this line, just to the east of the Dalälven River delta, and the northern limit of the 1905 geologic survey carried out by De Geer and his team of students. I had reached the tip of Billudden, the narrow sandy peninsula that marks the northern limit of Uppsalalåsen, which extends into the Gulf of Bothnia like an index finger (see fig. 2). The ridge is an esker, or os (*rullstensås* in Swedish), formed during the final stages of the last ice age by glacial debris deposited by the retreating Fenno-Scandian ice sheet. The jumble of stones lining the shoreline had their origins in the mountains to the north, and had been transported to their current location via subglacial streams flowing beneath the kilometre-thick ice mass. The natural terraforming forces previously unleashed here are hard to comprehend, as the power and drama involved in the creation of these post-glacial landscapes are barely perceptible from our temporal point of view. De Geer's line of investigation traced this esker for much of its northern length, while further south it aligned with the more easterly Stockholmsåsen, following it through the city to its southern extremity around Västerhaninge: a line of inquiry which stretches for some 200 kilometres obliquely across the territory of Stockholm—a line which uncannily aligns with my own path of exploration.

The objective of this article is to unpack the act of walking—perambulation—as a mode of creative research practice, where the line, defined here as the corridor of extraction along Stockholmsåsen and Uppsalaåsen, acts as a situated site of study from which to probe notions of extraction, material flows, land use, territorial transformations, and relations of entanglement. Path-following as Tim Ingold writes is 'not so much intentional as attentional. It thrusts the follower into the presence of the real. As intention is to attention, therefore, so absence is to presence.'[4] Walking as a creative, generative, and explorative practice becomes the mode from which to enter, experience, and investigate the 'presence of the real', which in this case becomes the terrain of the line and its entangled landscapes of extraction. To walk is to be grounded, both partially and subjectively—to be open to the unexpected and

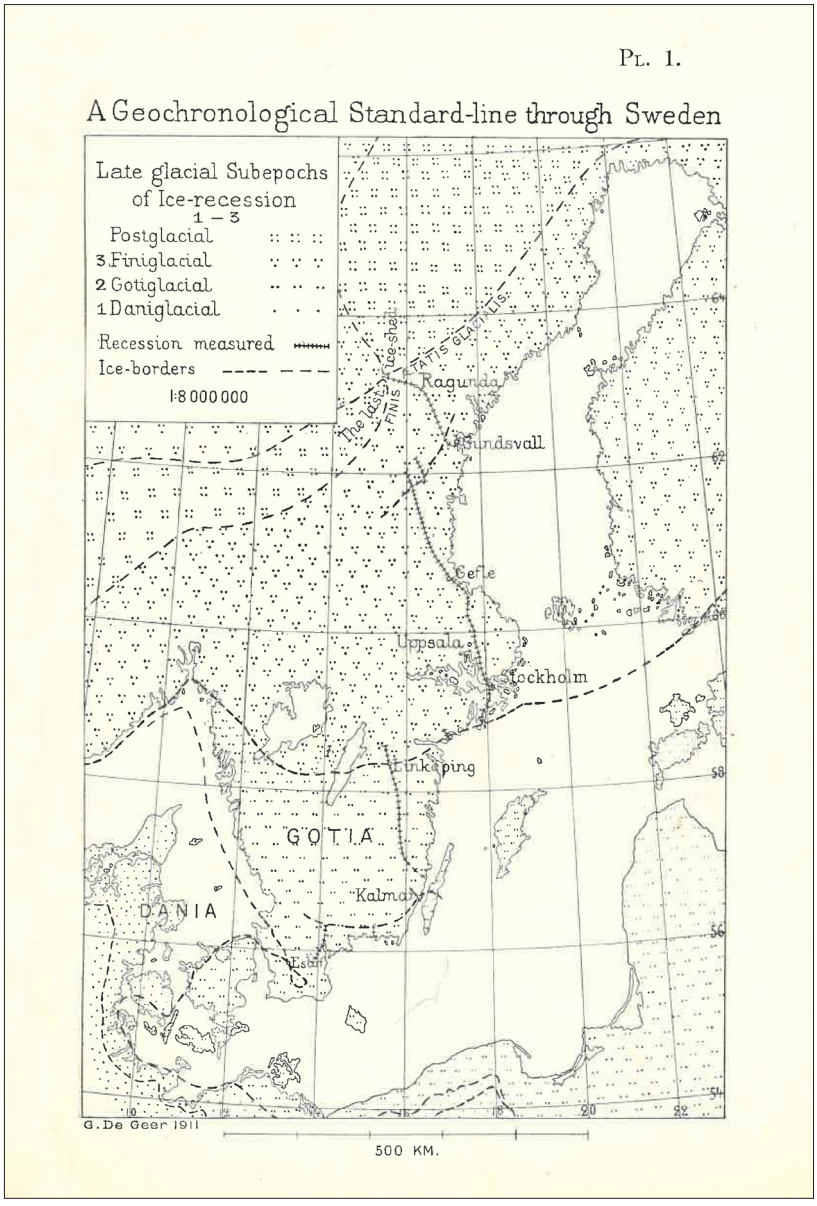


Fig. 1. Gerard De Geer's geochronological timeline through Sweden, illustrating the retreat of the Fenno-Scandian icesheet. The first part of the line measured in 1905, corresponding to area walked, can be seen running from south of Stockholm, past Uppsala, and culminating around Gävle / Gefle. Source: Gerard De Geer, 'A Geochronology of the Last 12 000 Years', in Compte Rendu : De La XIe Session Du Congrès Géologique International (Stockholm, 1910), fascicule 1, 1912, p. 283.

the unintended. It is a mode of research which brings experience, perception, and intuition into play, using the body as a sensory recording device to read and transcribe one's surroundings. This article aims to explore how walking as a creative research practice can contribute to heightening our sense of awareness of the world, and of the multiple entangled social, spatial, and temporal relations at play. How the humble act of walking is able to attune us to the subtle 'arts of noticing', to nurture a sense of deep time through instilling a habit of 'timefulness', and to gather and narrate alternative 'spatial stories', providing a particular, situated point of view that may allow us to imagine other ways of being, and other ways of acting in the world.

The line acts as a *frame* of investigation, delimiting the area of exploration to a defined geographic area. The line also functions as a *method* of research, where walking—tracing the line—becomes a primary mode of exploration. Reaching the tip of the peninsula at Billudden marked the end of my attempt to walk the length of both Uppsalaåsen and Stockholmsåsen in a disjointed,

Fig. 2. At the tip of Billudden, where the Uppsalaåsen disappears beneath the Baltic Sea. Source: photograph by the author (4 August 2023)

fragmentary manner over a period of several years. It was a journey which took me from the rural hinterlands of Södertörn, through the outer, as well as inner neighbourhoods of Stockholm, across the islands of Lake Mälaren, through the northern suburbs of Solna, Sollentuna, Upplands Väsby, and Bålsta, circumnavigating Arlanda International Airport, past the university city of Uppsala, and north towards the Baltic Sea. A patchwork of walks which in aggregation resemble the geochronological line approximated by De Geer and his students, following the fluvial glacial deposits scattered across the landscape. Material flows produced Uppsalaåsen and Stockholmsåsen as colossal quantities of water, ice, stone, gravel, sand, mud, and clay were pushed across the landscape by glacial and hydrological forces. Today material flows continue to alter and transform the terrain, driven by social, political, and economic forces. The line approximates the major seam of extraction in the Stockholm-Uppsala region, containing dozens of active quarrying operations, which combined, remove millions of tons of sand, gravel, and stone each year, feeding the insatiable demands of the construction industry. Material is dug up, sorted, washed, graded, and transported to one of the many ongoing construction projects throughout the region.

Donna Haraway teaches us: 'The only way to find a larger vision is to be somewhere in particular,' urging that we should 'seek those ruled by partial sight and limited voice—not partiality for its own sake, but, rather, for the sake of the connections and unexpected openings situated knowledges make possible'.[5] De Geer was able to understand, account for, and illustrate planetary-scale climatic shifts and continent-wide territorial transformations through observations of a particular segment of land close to his home in Stockholm through piecing together combinations of striated earth into a cohesive story. Resource extraction and extractive processes are frequently depicted at a zoomed-out scale, represented by the 'gods eye view' from above—the view from nowhere— or through abstract diagrams portraying vast logistical networks, financial flows, and material movements.[6] But what is actually happening on the ground, in the mud and the fine grain that is imperceptible from a distance? What can we learn from paying attention to material flows when situated in the midst of them, from somewhere in particular?

THE ARTS OF NOTICING

'To listen to and tell a rush of stories is a method,' argues anthropologist Anna Tsing. 'And why not make the strong claim and call it a science, an addition to

knowledge? Its research object is contaminated diversity; its unit of analysis is the indeterminate encounter. To learn anything we must revitalize arts of noticing …'[7] The same could be said of walking as a method— it is a practice which is observational, sensory, and immersive, interested in exploring contaminated diversity and open to the indeterminate encounter. Walking cultivates a patient research approach attuned to the 'arts of noticing', of being instinctively conscious of one's own position and relation to the world. A position which is always grounded, and subjective, aligning with Haraway's concept of a situated practice, where 'partiality and not universality is the condition of being heard to make rational knowledge claims. These are claims on people's lives. I am arguing for the view from a body, always a complex, contradictory, structuring, and structured body, versus the view from above, from nowhere, from simplicity.'[8]

When walking, there is no separation between the mind and the body—both are necessary to navigate and orientate oneself within a space—it is a reciprocal process, as thoughts drive movement, which in turn influences thinking and decision-making in a continuous feedback-loop. As Rebecca Solnit writes, 'Walking is ideally a state in which the mind, the body, and the world are aligned, as though they were three characters finally in conversation together. ... Walking allows us to be in our bodies and in the world without being made busy by them.'[9] Putting one foot in front of the other in a synchronized manner to thrust the body forward in space is a highly refined movement that our species adapted over several million years of evolution—a unique trait that in turn completely transformed us into what we are today. Walking on two feet freed human hands for other tasks, such as tool-making, art, and culture, and, as a consequence, radically expanded the thinking capacity of our minds.[10] Walking is a corporeal act involving a body in motion, and the practice of walking is just that—a practice. It cannot exist solely in a theoretical realm, and although plenty has been written about the theory and practice of walking, the word is no substitute for actually getting out into the world and experiencing it for yourself on foot.

If walking and thinking are inherently connected by reciprocal processes and walking is an embodied, situated practice, then one could also argue that thinking is also situated—we do not think in a vacuum, but generally in the same place as our bodies are located. As Hélène Frichot writes: 'Thinking takes place somewhere, and it is localized, taking up various bodies and their relations, human, non-human, admixtures of animate and inanimate things,

material and immaterial, a rip-tide, a maelstrom that all the while throws out a speculative gesture towards a future.'[11] Frichot uses the concept of 'thinkables' to describe the situatedness of thinking and thoughts, borrowing from the philosophical writings of Gilles Deleuze and Isabelle Stengers.[12,13] A thinkable, according to Frichot, is '[i]ndependent of either a given thinker or a fixed object of thought; instead it circulates between both in the midst of an event. … It is less the thought that I have than the thought that strikes me, coming from elsewhere, emerging in the midst of encounter—not "I think" but "something makes me think."'[14] If it is through the encounter that thoughts strike us—not formulating in the isolation of the mind, but rather already circulating in the world between bodies, objects, and places—then walking is an activity that makes us receptive to the possibility of just such a transformative encounter.

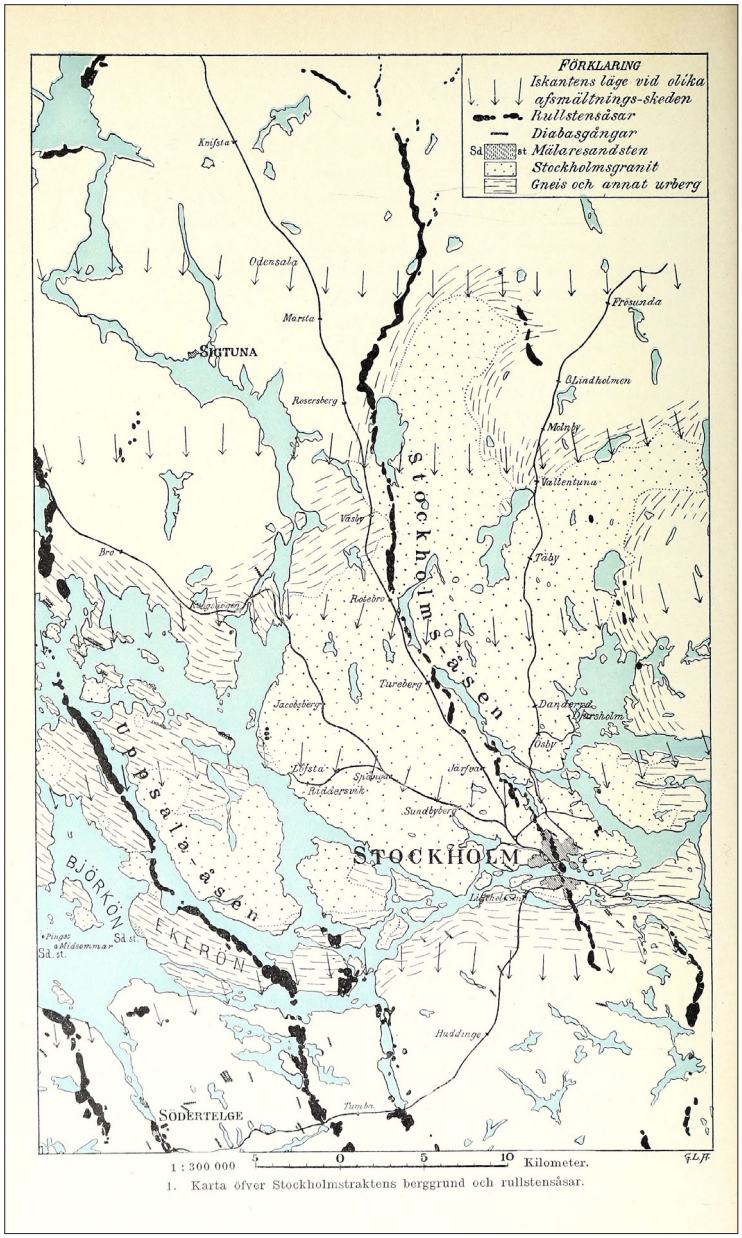
The view from a body is always partial, and subjective, and the body itself is not a static entity, but something that changes, deteriorates, decays. Bodies become exhausted, and it must be noted that walking is an exhausting activity. The feet swell and blister, the calf muscles cramp, the knees quiver, the back aches, the shoulders chafe from the rubbing of backpack straps, the skin suffers from exposure, mosquitos, stinging nestles, and thorny raspberry bushes, the lungs struggle for breath, and the mind empties. Walking twenty or thirty kilometres in one day across rough, uneven terrain is an exhausting activity, yet it somehow also brings about a state of being that is reflected in the exhaustive landscapes of extraction one passes through, or as Solnit writes: 'The rhythm of walking generates a kind of rhythm of thinking, and the passage through a landscape echoes or stimulates the passage through a series of thoughts.'[15] Exhaustion is not the same as tiredness—when one is tired one thinks of sleep and rest—exhaustion is instead about wakefulness, about anxious restlessness. Exhaustion, according to Frichot, 'is that which is drawn out, resolving itself in dissolution, or else in the glimmer of some new possibility'.[16] Walking across Stockholm's zone of extraction one is confronted by the scale of destruction, as vast quantities of earth continue to be removed and dispersed, and the territory is seemingly turned upside-down as ridges are transformed into canyons. However, through being attuned to the arts of noticing, through being immersed and embedded in the local environment-world, other things come into focus—a young deer scurries down a gravel ridge, a fox prowls between idle machines, bouquets of golden wild mustard flowers sprout from recently upturned earth—patches of life

unexpectedly thrive amongst the ruins, offering fragments of hope and the glimmer of new possibilities.

CRAFTING A HABIT OF TIMEFULNESS

Uppsalaåsen and Stockholmsåsen are distinctly linear geologic features, starting at one point and ending at another, drawing weaving paths between these two locations—they represent the spatial manifestations of deep time, enmeshed within the contemporary urban landscape. Each line has a thickness, a density and weight, sometimes making broad strokes like an ink brush, at other times barely touching the surface like a graphite pencil. Gradients of intensities, extending both vertically and horizontally, with shifting centres and permeable edges. While they appear to depict the continuous meandering path of an ancient river, the ridges represent a series of culminative snapshots of those ancient flows, capturing the moment when the sub-glacial streams breached the steep border of the land ice, and rushed into the sea. As De Geer observed, 'Thus every ose-centre is nothing else than the proximal glacier-arch portion of an annual layer and, if this is to be compared to a fan, corresponds to the very handle of it. ... Thus the whole series of those fans are placed as tiles, one over the other ...'[17] The stop-motion composition of these eskers becomes evident at certain points along the line where the ridge suddenly disappears, only to reappear at another location (see fig. 3). The most notable break along Stockholmsåsen occurs south of the city, where the ridge jumps six or seven kilometres to the west between Alta and Enskede, representing a sudden and dramatic shift in position of the fluvial-glacial delta, possibly caused by a localized partial collapse of the ice sheet at some point in the past.[18]

When walking the line, one becomes acutely aware of the multiple temporalities embedded in the landscape, stretching like an elastic band from deep time, through the present, and onwards into an unknown future. Geologist Marcia Bjornerud has termed this form of spatial-temporal perception the 'habit of timefulness', a point of view that can offer 'a clear-eyed view of our place in Time, both the past that came long before us and the future that will elapse without us'.[19] Bjornerud argues that we need to forge a new relationship with time if we are to avoid the catastrophic consequences of unmitigated climate change, astutely noting: 'The use of the word glacial to mean "imperceptibly slow" is quickly becoming an anachronism; today, glaciers are among the rapidly changing entities in Nature.'[20] To walk along



1. Karta öfver Stockholmstraktens berggrund och rullstensåsar.

Fig. 3. Map showing the geology of Stockholm, including the location of eskers (black shading) and the glacier terminus at different periods during the glacial retreat (arrows). Source: Erik W. Dahlgren (ed.), Stockholm: Sveriges hufvudstad: skildrad med anledning af Allmänna konst- och industriutställningen 1897 enligt beslut af Stockholms stadsfullmäktige D. 2, J. Beckman, Stockholm, 1897

the eskers is to bear witness to the terraforming capacity of climate change, and the unfathomable forces nature previously unleashed upon the land in the not-so-distant past—a time when modern humans were also present. The eskers present a portal to a time when hydro-glacial forces pushed mountains of material across an undulating landscape, moved boulders the size cars hundreds of kilometres, and carved new lakes and watercourses into the terrain. At Viksta, north of Uppsala, a pebbly beach along the crest of the ridge marks the former shoreline, now situated fifty kilometres from the sea—a reminder of the changes this landscape has undergone in a relatively short space of time, and a forewarning of potential climate-induced changes yet to come.

The notion of 'timefulness' can also help us to grasp more recent, human-generated territorial alterations. If we can read the territorial history of the landscapes of Stockholm through the post-glacial accumulation of material, we can similarly read a separate layer of urban history through observing this same material's decumulation and dispersal. As cities expand and grow, so too do their territorial footprints. The quarries, pits, and holes that perforate the length of Stockholmsåsen and Uppsalaåsen could be read as a kind of ghost architecture—voids and absences that correspond to built edifices elsewhere. Landscape architect Jane Hutton terms these spectral territories 'reciprocal landscapes', suggesting that for every new construction there is a relational, often distant site of destruction needed to source, process, and transform building commodities. As Hutton writes: 'While construction materials may appear to be fixed commodities, they are anything but fixed in time, space, or form. Materials change shape as they travel from geological deposit or forest to factory and design project to landfill, passing through human hands and tools.'[21] The eskers of Stockholm were formed gradually through repetitive annual cycles of sedimentation, as a new layer of material was added to previous accumulations each melt-season, yet their alteration by human activities can be read similarly as repetitive cycles of destruction (see fig. 4).

Although produced by natural geological processes, the eskers surrounding Stockholm have been thoroughly altered over centuries through human modification. Large sections of the Stockholm ridge which previously passed through the inner core of the city have been removed completely, with their material diverted towards construction projects, roadworks, and land reclamation efforts (see fig. 5). The scale of these manmade transformations can

be observed when walking along Malmskillnadsgatan, which follows the original crest of Stockholmsåsen, running from Brunkerbergstorg to the Church of Saint Johannes. Suddenly the buildings on each side recede, as the road passes above the busy boulevard of Kungsgatan, which was cut through the ridge and opened to traffic in 1911. The archaeologist Matt Edgeworth employs the term 'humanly modified ground' to refer to the large amount of the earth's surface which has, in some way or another, been altered by human activity, encompassing urbanized areas, landfills, earthworks, cut features, mines, quarries, cultivated land, and multiple other examples. According to Edgeworth, all this humanly modified ground represents '... part of a single growing entity, which has also been called the "archaeosphere". This term is useful when considering humanly modified ground on a global scale, as a thin layer interposed between the unmodified geosphere and the atmosphere, intermeshed with the biosphere and the hydrosphere, and forming the material residue part of the technosphere.'[22]

The concept of humanly modified ground, as Thomas Juel Clemmensen explores in a recent study of time-based aesthetics in the port of Aarhus,

Fig. 4. At Trollsta, close to the southern extent of Uppsalaåsen, yearly bands of sediment are clearly visible in a cut through the esker at a sand and gravel quarry. Source: photograph by the author (6 July 2021)

can aid in 'sensitizing humans to some of the environmental conditions that characterize the Anthropocene'.[23] Illustrating time-based aesthetics and the processes of erosion and sedimentation by means of a series of found monuments at the port site (directly inspired by Robert Smithson's *A Tour of the Monuments of Passaic* from 1967), Clemmensen writes: 'These processes make it possible to entangle geologic time and address human engagement in geologic processes, which otherwise are too slow or too large to be perceived.'[24] When walking across 'humanly modified ground', particularly mines, quarries, and land altered by acts of extraction and excavation, one is confronted with the landscapes of the Anthropocene, and multiple entangled temporalities. The slow creep of deep time becomes perceptible as it rubs against the present, as geologic processes that transformed the landscape over centuries are mimicked by industrial machinery at a frantic pace.

Walking is an effective means of perceiving multiple temporalities in the environment, yet the act of walking itself also has a distinctly temporal quality to it. Walking is a practice which takes time—and in the process makes one acutely aware of time. It is also a practice that leaves fleeting traces behind in the form of footprints, which, as impressions, are slightly different from

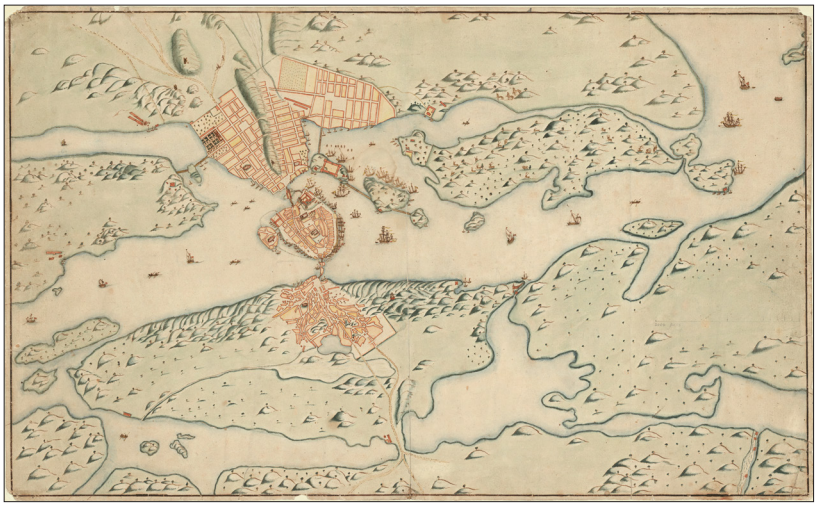


Fig. 5. This early map of Stockholm from 1642 clearly shows Stockholmsåsen in its original composition, physically separating the east and west neighbourhoods of Norrmalm. Source: Kungliga Bibliotekets Arkiv (Collections of the Royal Library, Stockholm)

inscriptions, since they retain a temporal existence and duration, and maintain a relation to the ground of upon which they belong. As Ingold remarks, rather than recording the trace of a gesture, 'footprints register emplaced movement'.[25] Ingold asks us to consider the difference between drawing and walking, and the contrasting actions between the hands and the feet, where 'the feet, bearing the full weight of the body, impress the ground rather than inscribing it. Although the movement of walking is continuous, each footfall makes a separate impression. For the path to appear along the ground as a continuous line it must be walked many times, or by many people, so as to iron out the incidence of individual treads.'[26] Footprints mark the movement of an individual, yet if repeated in a sequence will form a track, which if trodden enough may merge into a continuous path, at which time the trace of the individual is replaced by that of the collective, or the social.

The temporo-spatial act of walking might also be understood as having a performative dimension, drawing upon Judith Butler's distinction between performance and performativity, where performance assumes a subject, whilst performativity contests the notion of a subject altogether. A performance could be understood as an act, such as a play, or a dance, while according to Butler, performativity is 'not a singular "act", for it is always a reiteration of a norm or set of norms, and to the extent that it acquires an act-like status in the present, it conceals or dissimilates the conventions of which it is a repetition.'[27] The performative act, as defined by Barbara Bolt, building on the writings of J. L. Austin, 'doesn't describe something but rather it does something in the world. This "something" has the power to transform the world.'[28] Performative utterances have real effects. Walking, as a practice and as an action, has real world effects. Imprints on the ground caused by the weight and motion of the body leave footprints, which in turn can become serial arrangements leading to tracks, which if exposed to a continuous flow of pedestrian traffic will develop into the social infrastructure of tracks, paths, and roads. Walking Uppsalaåsen and Stockholmsåsen provides important insights into the performative capacity of walking, and its culminative effects over time. Historically, the eskers served as important transportation routes, connecting early Norse communities across space and time, as evidenced in the abundance of ancient burial mounds and rune stones situated along the line, later complemented by Christian cemeteries, medieval churches, and urban settlements. The main road between Stockholm and the north followed the crests of both Stockholmsåsen and Uppsalaåsen well into the seventeenth century, with the many hollow ways, or sunken lanes carved

into the hillside left as reminders of past repetitive movement. While today most major transport arteries no longer follow the crest of the ridge, the main north-south highway, as well as railway lines, still run parallel to Stockholmsåsen south of Uppsala, and to Uppsalaåsen to the north of the city. The performative utterances of a continuous and constant flow of footprints along a narrow linear stretch of land has had significant real-world effects on the social, political, and economic development of the region. The highway is just a further progression of a continuous succession of footprints.

GATHERING SPATIAL STORIES

Walking the line—following ancient fluvioglacial flows, as well as contemporary movements of construction materials—becomes a way of knowing the world through experiencing a relation to the places and things in it. It is a form of knowledge gleaned from the ground, felt in the body, and reflected upon in the mind. Walking becomes a method of reinscribing meaning and poetics on 'place' through a shift in perspective, of moving from the cartesian 'gods eye view' of the architect, planner, or geographer to a more immersive position much closer to the ground. A position where touch, smell, sound, and perception all combine to create a more nuanced understanding of the world. As Tim Ingold writes,

> Whereas the Kantian traveller reasons over a map in his mind, the walker draws a tale from impressions in the ground. Less a surveyor than a narrator, his aim is not—as Kant would have it—to 'classify and arrange', or 'to place every experience in its class', but rather to situate each impression in relation to the occurrences that paved the way for it, presently concur with it, and follow along after. In this sense his knowledge is not classificatory but storied, not totalising and synoptic but open-ended and exploratory.[29]

To walk is to be in *relation* with the world, and the humans and nonhumans that constitute it, or as Ingold writes: 'For the walker, movement is not ancillary to knowing—not merely a means of getting from point to point in order to collect the raw data of sensation for subsequent modelling in the mind. Rather, moving is knowing. *The walker knows as he goes along.*'[30] Walking through space, the body is in constant dialogue with the world around it, yet rarely situated in a fixed or static position—the relationship is dynamic, constantly shifting, and constantly changing. Before becomes after, in front of now behind, across becomes along, as one walks *over, across, through,*

among, around, down, along, and in-between. The spatial relations between the body and the environment-world around it are further highlighted by prepositions indicating direction, time, place, location, and relative position. Yet this constantly fluctuating milieu does not cause confusion to the walker; it is rather through this continuous feedback process that the walker knows the world.

A walker, as Ingold considers, is more like a narrator or a storyteller than a surveyor or geographer, less concerned with grasping the totality of a site or situation, and more interested in weaving meaning and poetics into place.[31] Walking is by its nature open-ended and exploratory, anticipatory of the unknown and unexpected. Walking becomes a mode of collecting and constructing what Jane Rendall refers to as 'spatial stories', which act 'as a theoretical device that allows us to understand the urban fabric in terms of narrative relationships between spaces, times and subjects. The notion of "spatial stories" can be connected to surrealist wanderings, to the situationist dérive as well as to more recent theoretical ideas about nomadology.'[32] Walking as a practice is interested in crafting narrative relationships, of gleaning bits and pieces from the world and putting them into connection with other objects, stories, and ideas. As a practice it is always, partial, fragmentary, and patchy—but this is a positive attribute—constantly obliged to re-orient, re-think, and re-navigate as new information comes into view and new relations are forged.

Walking the length of Uppsalaåsen and Stockholmsåsen I gather and construct spatial stories from the landscape, developing a particular perambulatory research method that is capable of uncovering hidden narratives, material histories, and entangled spatial relations. Walking as a creative-aesthetic practice, as Rendell notes, emerged out of explorations and artistic experiments by the Surrealists, and later the Situationists, but has since been enriched by a diverse and eclectic array of spatial and artistic practitioners and collectives, such as the Roman collective Stalker, who have been exploring walking as a creative research practice for over twenty years.[33] Formed in Rome in the mid-1990s by a group of young, disenfranchised architects and students, Stalker engaged with walking as a mode of architectural practice capable of rediscovering what they define as the 'Actual Territories' of the city.[34] In 1995 Stalker completed a multiday walk circumnavigating the urban periphery of Rome, following a route that intentionally avoided built-up areas, and instead plotted a course through the abandoned, neglected,

and marginal spaces which constitute a large part of the city. As Lorenzo Romito writes in the 'Stalker Manifesto', these territories' '… conscious presence cannot come about by direct experience, they are to be physically witnessed rather than represented. The archive of experience is the only form of mapping possible for these "Actual Territories"'.[35]

Another critical proponent of walking as a method of creative research practice was the Swiss sociologist, economist, and design educator Lucius Burckhardt, who called his particular practice (or science, as he referred to it) of walking 'Strollology'. According to Burckhardt: 'Strollology examines the sequences in which a person perceives his surroundings', providing a method from which one is able to observe, understand, and analyse aspects of the contemporary urban landscape.[36] In a similar, yet less subversive manner than Stalker, Burckhardt understood that the practice of walking had the capacity to reveal otherwise hidden aspects of the built environment, and provide architects and planners with new insights and perceptions enabling them to approach design in a more sensitive and socially embedded way. In 1987 in parallel with documenta 8 in Kassel, Burckhardt demonstrated his concept of Strollology with the collective walking performance *The Voyage to Tahiti*, which took place at an abandoned military training site on the edge of the city. A group of walkers were led across the semi-feral landscape as an actor read aloud texts from the travel diary of German geographer George Forster, who accompanied Captain Cook on his second voyage of the pacific in 1772.[37] The vivid descriptions of an island paradise set against the lush surroundings of the semirural hinterlands produced a heightened sense of perception among the walkers, as they became attuned and receptive to their surroundings.

Walking is just one of many strategies that offer the potential of engaging with the world as it already is. It's a strategy which provides a vantage point from which we can begin to rethink, reuse, repurpose, and reimagine the buildings, spaces, and landscapes that already surround us—our collective spatial heritage. Walking, as a creative research practice aligns with Peg Rawes' concept of relational architectural ecologies, which she defines as:

> … the diverse concrete and ephemeral spatiotemporal habits, patterns and rhythms of daily life which individuals, communities and societies develop within their cultural contexts and milieus. They are the critical, poetic, political and ethical strategies and

> imaginaries through which new spaces and places of occupation and inhabitation can be constructed.[38]

As walkers such as Lucius Burckhardt, Stalker, the Situationists, and others teach, there is much to learn from simply paying attention to the local environment-world that surrounds us. To walk, to roam, to ramble, to wander, to stray, to err—there is something slightly subversive, rebellious, and antagonistic in the act of walking. The word *error* has its origins in the Latin *errare*, which means to wander or roam. Errantry—the quality, condition or fact of wandering is often associated with exile, but as Caribbean poet and scholar Édouard Glissant wrote, there is also something emancipatory in the figure of the *Errant*, in its renouncement of fixed roots: 'Errant, he challenges and discards the universal. ... The thinking of errantry conceives of totality but willingly renounces any claims to sum it up or to possess it.'[39] Errant, as a state of being-in-the-world, informs Glissant's notion of a 'poetics of relation', 'a poetics that is latent, open, multilingual in intention, directly in contact with everything possible'.[40] Walking along Uppsalaåsen and Stockholmsåsen, following the material, occasionally off the beaten track and through unsanctioned spaces, is a way of experiencing Glissant's sticky notion of 'being-in-the-world' in all its messy and unstable manifestations. It is about being open to the contingent, unexpected, unplanned, and unintentional that constitutes much of the space we inhabit, about resisting generalizations and totalizing perspectives, seeking alternative imaginaries, and paying attention to what is happening on the ground.

THINKING LIKE AN ESKER

> Perhaps the farmers who did not want to move out of the Sand Counties had some deep reason, rooted far back in history, for preferring to stay. I am reminded of this every April when the pasque-flowers bloom on every gravelly ridge. Pasques do not say much, but I infer that their preference harks back to the glacier that put the gravel there. Only gravel ridges are poor enough to offer pasques full elbow-room in April sun. They endure snows, sleets, and bitter winds for the privilege of blooming alone.[41]

This poetic observation of the blooming patterns of pasque-flowers (pulsatilla vulgaris) by Aldo Leopold can be found in his seminal collection of essays, *A Sand County Almanac: And Sketches Here and There*, published

posthumously in 1949. The pasque-flower is a recurring subject in Leopold's work, appearing already in the introduction to the volume, where he writes: 'For us of the minority, the opportunity to see geese is more important than television, and the chance to find a pasque-flower is a right as inalienable as free speech.'[42] The short story of the pasque-flower offers an incredibly rich spatial, temporal, and embodied reading of the wild crocus flowers, providing a detailed account of their spatial habitat on gravelly eskers, situating them within a timeline stretching back to the ice age, and entangling them within the human world of the poor Sand County farmers. A Sand County Almanac could be understood as an early guidebook to the 'arts of noticing', teaching us to pay close attention to the subtilties of the world around as—the small shifts in landscape, climate, vegetation, and geology—and a forewarning of the unintended consequences caused by human-induced actions.

While Leopold does not write explicitly about walking as a practice, from his writings it is evident that he was an avid walker, with most of his insights and observations gleaned while on foot, either from around his farm in Wisconsin, or else on other travels through the wild spaces of the United States. In the short essay in part two of the collection titled 'And Sketches Here and There', Leopold recalls witnessing the death of a wolf at the hands of hunters, and in a revelatory moment realizing the critical role the species plays in maintaining balance in the ecosystem, writing: 'The cowman who cleans his range of wolves does not realize that he is taking over the wolf's job of trimming the herd to fit the range. He has not learned to think like a mountain. Hence we have dustbowls, and rivers washing the future into the sea.'[43] 'Thinking like a mountain' might be understood in a similar vein to Glissant's 'poetics of relation', as a particular way of being-in-the-world that entails an understanding and appreciation of the interconnectedness of everything—an awareness of the multiple entanglements between humans, nonhumans, and their spatial surroundings, and a temporal perspective extending beyond the horizon of a human lifetime.

Panta rhei, everything flows—so goes the famous dictum attributed to Heraclitus, the ancient Greek philosopher from Ephesus, and so begins the first sentence of Gerard De Geer's thesis on the geographic development of Scandinavia after the ice age, *Om Skandinaviens Geografiska Utveckling Efter Istiden*.[44] Walking, as a perambulatory research practice, offers a situated point of view from which to contemplate, understand, and observe a few of the many entangled relationships latent in the landscape. As I walk the line, following

the fluvio-glacial material flows along Stockholmsåsen and Uppsalaåsen, I embrace Leopold's ecological ethic of 'thinking like a mountain', or in this case of 'thinking like an esker'. Through the practice of paying attention—the arts of noticing—I become keenly aware of the subtle changes in the landscape around me, the humans and more-than-humans that have shaped the environment, and open to the stories and thinkables I may encounter. Cultivating a habit of 'timefulness' I become attentive to the multiple temporal scales I pass through and interact with, deciphering the glacial movements of the distant past, yet equally imagining an alternative future beyond the present, and lastly, gathering 'spatial stories'. I gain knowledge of the word through experiencing it, gleaning new meaning and poetics by revealing the narrative entanglements between spaces, time, and subjects. Everything is interconnected, and everything moves, it is just a matter of seeing the world from a particular point of view, of reading the multiple spatial and temporal stories already embedded in the earth.

NOTES

[1] Gerard De Geer, 'A Geochronology of the last 12 000 years', in *Compte Rendu : De La XIe Session Du Congrès Géologique International* (Stockholm, 1910), fascicule 1, 1912, p. 241.

[2] De Geer, 'A Geochronology', p. 242.

[3] De Geer, 'A Geochronology', p. 247.

[4] Tim Ingold, *The Life of Lines* (New York: Routledge, 2015), p. 133.

[5] Donna Haraway, 'Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective', in *Feminist Studies*, 14/3 (Autumn 1988), pp. 579–99, esp. p. 590, https://doi.org/10.2307/3178066 [all URLs here accessed in December 2024].

[6] For various examples of 'gods eye view' depictions of extraction and a general critique of visual representations of the Anthropocene, see T. J. Demos, *Against the Anthropocene: Visual Culture and Environment Today* (Berlin: Sternberg Press, 2017)

[7] Anna Lowenhaupt Tsing, *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins* (Princeton, NJ: Princeton University Press, 2015), p. 37.

[8] Haraway, 'Situated Knowledges', p. 589.

[9] Rebecca Solnit, *Wanderlust: A History of Walking* (London: Granta, 2001), p. 5.

[10] Solnit, *Wanderlust*, p. 18.

[11] Hélène Frichot, *Creative Ecologies: Theorizing the Practice of Architecture* (London: Bloomsbury, 2018), p. 177.

[12] Gilles Deleuze, *Difference and Repetition* (New York: Colombia University Press, 1994), p. 139.

[13] Isabelle Stengers, *In Catastrophic Times: Resisting the Coming Barbarism* (Ann Arbor, MI: Open Humanities Press, 2015), p. 131.

[14] Frichot, *Creative Ecologies,* p. 174.

[15] Solnit, *Wanderlust,* p. 5.

[16] Frichot, *Creative Ecologies,* p. 71.

[17] De Geer, 'A Geochronology', p. 245.

[18] Erik Fromm, 'Bilaga A: Stockholmstraktens geologi', in *Generalplan för Stockholm 1952 = A general plan for Stockholm 1952* (Stockholm: Stockholms stadsplanekontor, 1952), p. 422.

[19] Marcia Bjornerud, *Timefulness: How Thinking like a Geologist Can Help Save the World* (Princeton: Princeton University Press, 2018), p 17.

[20] Bjornerud, *Timefulness*, p. 131.

[21] Jane Hutton, *Reciprocal Landscapes: Stories in Material Movement* (New York: Routledge 2020), p. 5.

[22] Matt Edgeworth, 'Humanly Modified Ground', in Dominick DellaSala and Michael Goldstein (eds.), *Encyclopedia of the Anthropocene* (Oxford: Elsevier, 2017), pp. 157–61.

[23] Thomas Juel Clemmensen, 'Humanly Modified Ground and Time-Based Aesthetics', in *Journal of Landscape Architecture*, 17 (2022), p. 46, doi:10.1080/18626033.2022.2110418.

[24] Clemmensen, 'Humanly Modified Ground', p. 46.

[25] Ingold, *The Life of Lines,* p. 63.

[26] Ingold, *The Life of Lines,* p. 61.

[27] Judith Butler, *Bodies that Matter: On the Discursive Limits of Sex* (New York: Routledge 1993), p. 12.

[28] Barbara Bolt, 'A Performative Paradigm for the Creative Arts?' *Working Papers in Art and Design*, 5 (2008), p. 8.

[29] Ingold, *The Life of Lines,* p. 48.

[30] Ingold, *The Life of Lines,* p. 47.

[31] Ingold, *The Life of Lines,* p. 47.

[32] Jane Rendell, *Art and Architecture: A Place Between* (London: IB Tauris, 2007), p. 190.

[33] Rendell, *Art and Architecture*, p. 190.

[34] Peter Lang, 'Stalker unbounded: urban activism and the terrain vague as heterotopia by default', in *Heterotopia and the City: Public Space in a Postcivil Society*, ed. Michiel Dehaene and Lieven De Cauter (New York: Routledge, 2008), pp. 215–24.

[35] Francesco Careri, *Walkscapes: Walking as an Aesthetic Practice* (Barcelona: Editorial Gustavo Gili, 2002), p. 166.

[36] Lucius Burckhardt, 'Strollological Observations on Perception of the Environment and the Tasks Facing Our Generation', in *Writings: Rethinking Man-made Environments: Politics, Landscapes & Design*, ed. Jesko Fezer and Martin Schmitz (Vienna: Springer, 2012), p. 239.

[37] Jesko Fezer and Martin Schmitz (eds.), *Writings: Rethinking Man-made Environments: Politics, Landscapes & Design* (Vienna: Springer, 2012), p. 25.

[38] Peg Rawes (ed.), *Relational Architectural Ecologies: Architecture, Nature and Subjectivity* (New York: Routledge, 2013), p. 11.

[39] Édouard Glissant, *Poetics of Relation,* trans. Betsy Wing (Ann Arbor: University of Michigan Press, 1997), p. 47.

[40] Glissant, *Poetics of Relation,* p. 58.

[41] Aldo Leopold, *A Sand County Almanac: And Sketches Here and There* (New York: Oxford University Press, 1972), p. 90.

[42] Leopold, *A Sand County Almanac*, p. 6.

[43] Leopold, *A Sand County Almanac*, p. 113.

[44] Gerard De Geer, *Om Skandinaviens Geografiska Utveckling Efter Istiden* (Stockholm: P.A Norstedt och Söner, 1896), p. 5.

UNRAVELLING MULTI-ACTOR AGENCIES IN A FRAGILE LANDSCAPE

Violaine Forsberg Mussault

ABSTRACT

Cultural landscapes embody the intricate interrelation between cultural practices and the inherent natural features of a place, evolving gradually over time. They have been carefully shaped by human adaptation to the geomorphological conditions, strategically harnessing site dynamics and natural processes. However, these vernacular landscapes are increasingly being disrupted by the accelerating and unpredictable effects of climate change. Natural hazards such as floods, droughts, and landslides are becoming more frequent and severe in Norway, as in many places worldwide, posing new threats to cultural practices and the resilience of the communities that maintain them.

This article examines transdisciplinary methodologies for uncovering the complex dynamics of a hazardous environment through a comprehensive reading of a site in the Undredal valley in Western Norway. Through emphasizing interdisciplinary collaboration and the incorporation of community perspectives, the study proposes approaches and methods for integrating geological, hydrological, and ecological sciences with local knowledge. It also seeks to read and explore influential nonhuman forces that shape the landscape—such as water and rocks—and examine the relational dimensions that connect these entities to the local community.

The article introduces four key analytical approaches to engaging with such complex sites: *deciphering forces, unravelling interwoven relationships, understanding community attachments, and exploring more-than-human socialities*. In doing so, the paper highlights ways to engage with site knowledge production that acknowledge the plurality and entanglements of the human and nonhuman agencies at play. This in-depth analysis aims to serve as a steppingstone towards nuanced and integrative approaches to adaptation strategies that extend care to nonhuman beings.

KEYWORDS

landscape architecture, natural hazards, transdisciplinarity, more-than-human

INTRODUCTION: THE UNDREDAL VALLEY, A VULNERABLE CULTURAL LANDSCAPE

> The road out of the village was closed by landslides around five o'clock in the afternoon on Christmas Day. There were landslides near Langhuso, but several smaller landslides down the valley. On the Hjøllo side of Melhus, there had been several landslides, and the area looked like a battlefield. Landslide after landslide had occurred on the road ahead, and around Skjebbe a root had taken parts of the road with it on its journey down the slope. Three smaller landslides occurred on the old road between Melhus and Langhuso. Two in the first part of the road, and a landslide just before Djupsåna. Only material damage after the storm.[1]

This description, excerpted from the Norwegian Water Resources and Energy Directorate register of past landslide incidents, describes damage in the Undredal Valley after extreme weather *Dagmar* in December 2011. It demonstrates the impressive speed with which the mountain's active processes are coming to life, creating a radically different landscape made of rocks and mud.

The twenty-kilometre-long Undredal Valley is located in the Aurland municipality along the Aurlandsfjord, a branch of the impressive Sognefjord. The region is surrounded by rugged mountain landscapes, with peaks rising sharply from the fjord, creating a striking backdrop to the waterways and valleys. It is captivating how humanity has established settlements in these deep, steep-sided valleys. Grazings and shielings are nestled into the rocky slopes. While these areas are smaller and more fragmented than is evident from land-use maps, they operate within a complex system that encompasses parameters such as altitude, seasonality, sunlight, and the sharing of resources amongst different farms. The landscape is a weblike tapestry intricately interwoven with the forests and craggy mountains. It is crafted through the nuanced site knowledge held by the herders and woven into a complex network of paths within the land—'a movement heritage of hooves and feet', as described by Norwegian anthropologist Karen Lykke Syse.[2]

This landscape, delicately etched onto a remarkably sharp topography and amalgamating various natural phenomena, is both compelling and intricate. Hence, the valley faces significant challenges, including flooding, rockfalls,

landslides, and avalanches. Herders have adapted their practices and routes to navigate these constraints, integrating the inherent instability of the landscape as a natural part of their relation to the land. Shaped over time by gradual human adaptation to geomorphological conditions and the local environment, Undredal's landscape has continuously accommodated natural hazards: The interplay between pastoral practices and hazards has fostered gradual adaptation and cohabitation in everchanging conditions.

Rockfalls and landslides are common in spring, when snow from the summit melts. However, the acceleration and unpredictability of climate change is now altering the behaviours of familiar natural phenomena. Milder temperatures and shifting weather patterns, along with heavier rainfall, have led to more unpredictable events from various actors in the landscape—rocks, soil, streams, and torrents—resulting in more frequent landslides, mudslides, rockfalls, and floods.[3]

Discussions with the local community have thus revealed that the velocity of the last major flood in 2014[4] has disoriented them, as shown in interviews.[5] As they see it, their knowledge of the place, specifically regarding the unique features of this landscape—such as the ability to decipher weather patterns, assess slope stability, and interpret wind directions—no longer suffices to understand the new dynamics and behaviours of their environment. The landscape is breaking with the seasonal patterns to which the community was accustomed, causing a sense of disorientation. Moreover, the accelerated pace of these changes does not allow for gradual adaptation and the community now requires guidance and support in adapting.

This article stems from a reflection on the need to enrich site-based knowledge in Undredal's hazardous environment, posing the question of how to build a comprehensive understanding—one that integrates both local and scientific knowledge—of the ongoing and uncertain processes at play. Indeed, the study posits that, despite the unpredictability and uncertainty of natural phenomena, we need to develop a careful understanding of them and strive to comprehend their behaviours, processes, and drivers—thereby requiring both the skills of reading the landscape and scientific expertise.

I argue that to generate adaptative guidance for Undredal Valley, we must rely on a what I call *thick site knowledge*—a thorough understanding of both cultural, human-driven processes and the multifaceted web of nonhuman

agencies.[6] Landscape architect and scholar Alison Hirsch discusses *thick descriptions* and argues that it is 'time we return to the thickness of landscape—its temporal and sectional thickness, as well as the thick complexity of the cultural processes that shape it'.[7] Building on her idea, I suggest expanding *thickness* to include the many nonhuman processes that constitute a site as a complex web of relations. This approach aims to unfold the intricate interactions and practices at play in the valley, framing it as a *hybrid landscape*[8] within the broad context of the Anthropocene, in which humans' intentions and environmental forces interact with each other.

CONTEXT AND FRAMEWORK

This essay is situated in the frame of the *Naturact* research project, led by five Norwegian research institutions[9] with an interdisciplinary team of ten experts from various scientific fields. The different disciplines are organized into distinct areas of expertise. Some, such as geologists, geotechnical engineers, and a hydrologist, work in the earth sciences. Others, represented by climate scientists, focus on climate modelling. A third group consists of architects and cultural heritage experts. Finally, the field of design and spatial analysis brings together a system designer and three landscape architects.[10]

The *Naturact* research project experiments with interdisciplinary methods for developing Nature-based Solutions (NbS) as responses to natural hazards, using Undredal Valley as case study.[11] It aims to formulate a landscape-based adaptation and mitigation strategy for different types of natural hazards by showcasing large-scale NbS-integrating contributions from various fields as well as insights from the local community. From the perspective of landscape architecture, one of the research aims was to establish a comprehensive and integrative landscape approach from the outset by applying NbS at the scale of a large cultural landscape, which is not yet common outside of coastal areas.

The Undredal case study site was chosen because it represents a typical landscape typology of Western Norway, featuring rugged mountainous terrain and numerous natural phenomena and hazards, all within a dynamic environment in which the community remains actively engaged.[12] The team decided to ground the work in a comprehensive and multidisciplinary site analysis as a first step. This task was led by the system designer and myself, while integrating contributions from the research team as a whole. Within

the framework of the research project, I was responsible for the first phase of the landscape study for the Undredal case study. The following discussion arises from the contexts of this project and my role at the intersection of multiple disciplines.

A Complex Landscape to Decipher

It took little time to grasp the powerful geomorphology of this narrow, confined valley, primarily observed from the only road running alongside the river on the valley floor. At first glance, the valley appeared to be predominantly forested and wild, with settlements concentrated in the village at the far end along the fjord. However, for the three landscape architects, it quickly became apparent that this simplified view was inadequate. A more thorough analysis was necessary and required in-depth methods due to the interplay of natural hazards, geomorphology, and the contrasting seasonal dynamics of herding practices. Initial discussions with breeders confirmed this issue, highlighting the complexity of goat grazing and the intense interaction between natural dynamics and human practices. This prompted me to ask: *How can the patterns and trajectories of this landscape be read and interpreted? How do pastoral practices, which shape the cultural values of the landscape, interact with natural phenomena? How can the lively and processual dimension of the landscape be grasped?* It thus appeared that the landscape called for a nuanced understanding of the intricate interplay between the natural and anthropogenic forces shaping it.

Expanding on 'What' Is at Risk?

Risk and natural hazard are related concepts but have distinct meanings in the context of natural disasters. Natural hazards represent actual events or phenomena, while risk concerns the potential negative consequences of these hazards and is a concept that integrates the probability and potential impact of these hazards on human societies and the environment. In other words, natural hazards exist in the natural and physical world, whereas risks do not. Scientific risk assessment produces quantitative approaches that define risk thresholds for each type of risk based on the density of recorded events and event probabilities. Risk assessment maps are essential in Norway and critical tools for evaluating and managing various natural hazards.[13]

Although the available maps and documents provide a wealth of data on the types of natural phenomena at play, they tend to show them only by isolating

these phenomena instead of expressing the interrelated processes behind them. Additionally, the use of risk assessment maps as a way of categorizing and describing natural hazards could be framed as anthropocentric, as they focus solely on the damage that can be caused to human infrastructure, particularly buildings. Hence, from a landscape perspective, they are limited because they fail to capture the fragilities that natural hazards might cause to the non-built landscape. They overlook the landscape's sensitivity and cultural character and fail to address the vulnerabilities of nonhuman entities or the specific values of a cultural landscape that combines human and nonhuman processes (such as pastures, meadows, orchards, and forests). Learning from the locals in Undredal, it is evident that landslides and avalanches damage pastures, shielings, and transhumance trails, amongst other key features. Additionally, floods erode the valley floor and small orchard plots when the torrent overflows its banks. Some herders described how more frequent mudslides in the Djupsåna stream frequently damage a wooden bridge used for goat transhumance.[14] Yet, the increasing frequency of hazards creates friction within the cultural landscape, and risk maps alone are not sufficient to understand and communicate the complex dynamics at play.[15] My aim, as a landscape architect, is thus to address these dynamics by gaining a deeper understanding of the processes that affect the entire landscape.

Figure 1. View of the Undredal Valley, summer 2023. Source: the author

To address the interplay between the landscape and its fragilities, there is a need for an approach that moves away from the notion of *risk* and instead foregrounds the notion of *natural phenomena*, so as to overcome the distinction (inherent in risk assessment maps) between human infrastructure (buildings and roads) and the environment. This perspective allows for a broader consideration of the entire valley as a single *site*, a key notion that will be unfolded in the section that follows.

APPROACHES AND METHODS

Asserting the Site as a Prerequisite

The *site* assumes the role of the principal agent in landscape architecture design, and the significance of the concept of the site within landscape architecture practice is widely acknowledged: 'The ability to read and edit the "as found" has, to a certain degree, always been a primary point of departure for landscape architecture,' says landscape architect Ellen Braae.[16] Working *with* and *from* a site involves not only engaging with its inherent ecological and environmental characteristics[17] and cultural aspects, as underscored by landscape architect Michel Corajoud.[18] He goes beyond defining the site as a physical space and emphasizes the importance of comprehending a site's social context and viewing it as a repository of history, memory, and meaning. In his perspective, the site has great significance and potential that need to be uncovered in order to play a foundational role in landscape architecture and urban design. Thus, from the standpoint of landscape architecture, a *site* is not merely a plot of land; it embodies a certain coherence, carries specific significance, and refers to 'seemingly opposite ideas: a physically specific place and a spatially and temporally expansive surround'.[19] The site represents a holistic whole, both physically and in terms of community and lived experience. By acknowledging that each location has unique environmental, cultural, and social characteristics, this understanding is widely shared in spatial design, and the complex and multifaceted notion of a site serves as a prerequisite for landscape design.

Within the *Naturact* research team, landscape architects have argued that a site-based approach would emphasize the importance of site-specific responses to hazards, reflecting the principle that *what-is-good-is-what-works-here*.[20] Nevertheless, framing the site as a steppingstone has been challenging in an interdisciplinary setting. Indeed, a site-based approach is complex and uncommon outside the disciplines of landscape architecture

and urbanism. To avoid a simplistic definition of the site's scope based solely on available scientific data, a transdisciplinary framework was deemed essential to capturing the complexity and many dimensions of the site.

Landscape architects and planners have stressed the need to anchor climate risk projects in site-specific contexts and site thinking[21]—demonstrating that the relevant framing of the study site ensures that the analysis and design interventions are scaled correctly to address both immediate and broader spatial issues.[22] Urban planner James LaGro explicitly advocates for a proper scoping and delineation of a site, and argues that defining the study's boundaries is a critical step in the site planning process, and essential for developing effective, context-sensitive, and sustainable solutions.[23]

For my research partners in the earth sciences, treating the site as a foundational element rather than focussing solely on geo-technical aspects marked a significant shift, and developing a shared understanding that transcends single-discipline approaches and integrates multiple layers across scales was challenging. At the same time, this challenge also presented an opportunity: Grasping the site's hybrid character and addressing its diverse 'registers of significance' demanded a 'constant crossing of knowledge categories' within a hybrid interdisciplinary and construct.[24]

Interdisciplinary Approaches to Site Reading

In the context of fieldwork, landscape architects traditionally focus primarily on a site's visible and tangible aspects. However, in Undredal, a key challenge is understanding the landscape's unseen dimensions—recognizing that what is most significant is not always what is visible, but rather the underlying phenomena and events that drive the evolution of a place.[25] The members of the research team strongly believed that experiencing the site together as a team—being *in situ*—in order to integrate diverse perspectives and establish a common language would lay the foundation for an interdisciplinary approach. To implement this, the team held an on-site workshop that brought together eleven researchers for a period of three days, with the aim to foster an exchange of knowledge by contextualizing and integrating the available scientific expertise.[26] It involved various team activities, including discussions of maps, fieldwork, co-walking sessions, and targeted field visits. Beside this preliminary collective endeavour, I conducted a series of eight field visits between January and December 2023, on my own or accompanied by fellow

researchers from the team. They were conducted across different seasons, thus facilitating an iterative fieldwork process. Each session uncovered previously unnoticed processes and contributed to a richer understanding.[27]

While earth science researchers analyse the environment through specialized frameworks, the practice of landscape reading— conducted in situ by the three landscape -architects— helped integrate these perspectives into a more holistic and comprehensive understanding. During fieldwork with fellow researchers, the subtle process of integrating scientific knowledge into a guided, real-time reading of the site aloud fostered a detailed and vivid understanding of what was observed. It often revealed aspects invisible to the naked eye, hidden beneath the ground's surface, such as the slow weathering processes that occur over extended timescales.

Fostering interdisciplinarity in fieldwork often involved the landscape architects initiating discussions and asking questions like, 'Why is this particular bank more eroded than others?' or 'Is there a side of the valley more prone to landslides?' Such inquiries aimed to uncover the dynamics and processes behind observable phenomena. In addition, questioning and speculating during our team discussions enhanced the interpretation of available technical or scientific data—such as geological studies, risk reports, and maps—by bringing them into a tangible and physical spatial context. Interpretating the landscape through thematic lenses—such as geology, biology, and hydrology—fostered a collective understanding amongst the team. In this collective and interdisciplinary effort, the landscape architects provided a critical reading of human settlements and land use in situ, often integrating past, present, and future into a dynamic interpretation. During on-site dialogues, we usually combined different scales, timeframes, and topics to capture the interactions between past processes, ongoing activities, and the tangible realities of the site. In this sense, landscape interpretation added depth to the perception of space, imbuing it with meaning and imagination,[28] consequently enabling gradually a nuanced understanding of the site to emerge.

Walking and Co-Walking

In fieldwork, walking as a method is particularly important as a catalyst for knowledge exchange across disciplines. Landscape architect Henrik Schultz has described how interdisciplinary walks help practitioners perceive intensively and provide a vivid understanding of the space traversed in complex

situations. Walks allow for discussing perceptions and sharing views on site while experiencing the object of research, creating a specific 'knowledge which is always meshed with the immediate perception it has to be applied to'.[29] Three paired walks with fellow researchers were particularly revealing. One of them, an upstream journey along the Undredalselvi river with the hydrologist, highlighted various bank erosion patterns on the main river and enabled me to look closely at the water network. That day, the heavy rainfall provided an opportunity for real-time observation of the evolving water processes, including stream flow, soil erosion, and the formation of new channels on the steep slopes, which were quickly filled with water that became discoloured by the eroded soil. The hydrologist's insights during our one-day walk were key in contextualizing our observations and enriching my understanding, guiding me to observe unexpected details. On another occasion, an early spring walk with one of the geotechnical engineers gave me insights into natural hazards through focussed, geology-oriented, on-the-ground observations. This walk revealed signs of slope instability and tangible, yet discrete clues of mountain activity, including traces of past landslides and rockfalls. My colleague explained how to interpret evidence, such as scree material and damaged tree trunks, which here indicated past rockfalls.

Local Encounters

The study has been shaped by numerous interactions and exchanges with the locals. Initially, they were informal, consisting of chance encounters in the field. Over time, these interactions expanded to include interviews with goat herders, who were found to possess the most extensive and detailed knowledge of the landscape, particularly regarding natural hazards and their direct and embodied experience of the land. Four individual interviews were conducted in an open format, allowing for the free flow of personal experiences and anecdotes. The questions primarily focussed on risk perception, landscape cycles (changes over the last decades, seasonal cycles, and so on) and the herders' embodied understanding of the landscape. Additionally, two participatory workshops with the inhabitants were organized: The first one aimed to gather the community's views of the landscape, their impressions and subjective experiences, and knowledge of natural hazards. The second workshop focussed on discussing the values the community assigns to the landscape and on addressing potential threats confronting pastoral practices as well as exchanging preliminary ideas around NbS.[30]

Emerging Approaches to Thick Site Readings …

As outlined, the study has used various methods to gradually build a reading of the landscape and its processes, with the aim to construct comprehensive and rich situated knowledge.[31] In the context of interdisciplinary teamwork, I understand this as knowledge that recognizes the diversity of perspectives shaped by the experiences and contexts of the individuals or groups involved in its creation.

Fieldwork and interdisciplinary activities with the *Naturact* team research fellows lasted over a year and spanned all four seasons. My aim within this diverse team, with specialized expertise across various themes, was to weave these perspectives into a holistic reading of the site. This process was carried out using an iterative approach, which allowed me to gradually familiarize myself with issues related to natural hazards and to deepen my understanding of these phenomena and their mechanisms, ultimately enabling me to translate this knowledge into a landscape vocabulary. The multiple methods described, along with the many fieldwork sessions, complemented each other and, over time, formed a polyvocal approach to the site's specificities. The knowledge production process was not only a gradual and layered accumulation but also multifaceted, incorporating multiple scales, perspectives, and disciplines, built upon diverse empirical material. Integrating diverse forms and sources of knowledge involved blending personal, situated insights from fieldwork with scientific research and tacit local knowledge. It encompassed

Figure 2. Two facets of the Undredal valley. On the left the cultural landscape in full activity during the summer of 2023; source: the author. On the right, a landslide from the fall of 2014. Source: Linn-Janette Underdal Skarsbø

various activities, ranging from collecting local anecdotes to analysing geomorphological data and interpreting cartographies.

A transdisciplinary understanding of the landscape emerged gradually through the multimodal engagement with researchers and the local community. The material accumulated as a result of this transdisciplinary and nonlinear approach was later examined retrospectively, leading to the identification of the four key themes—or analytical approaches—presented in the next sections.

Unravelling the Landscape: Four Perspectives on Site Reading

This section presents the findings from the four approaches to reading the site. Rather than offering a fixed methodology or a replicable model, these approaches provide potential ways to engage with hazardous landscapes. They suggest lenses for adopting a more-than-human perspective in landscape reading: Adopting a more-than-human perspective in landscape reading, for me, denotes an approach that seeks to go beyond human-centred interpretations of landscapes—and, specifically in this context, a human-centred interpretation of natural hazards.[32] The more-than-human perspective aims to consider and decipher the agency and influence of nonhuman entities—such as animals, plants, geological forces, and weather conditions—in shaping (and simultaneously being shaped by) the landscape. This view emphasizes the importance of understanding nonhumans—their singular behaviours, needs, and 'ways of being alive'.[33] It regards them not merely as passive elements, but also as active participants, actors, or 'partners'.[34] I argue that this understanding is crucial for planning adaptative solutions and strategies that not only prioritize human interests but also consider the needs of nonhuman beings. Reading and understanding how nonhumans have agency in landscape processes is essential, especially in times of rapid and uncertain change, if we are to design landscapes that are experienced and lived as sensitive entanglements of both human and nonhuman life.[35]

1. Deciphering the Forces at Play

Water plays a crucial role in crafting Undredal's landscape. This can be observed throughout this landscape, where mountains and a network of torrents intertwine. The steep relief offers a compact yet tangible view of the water cycle—from ice to stream, raindrop to torrent, and ultimately to the delta, on the fjord's outer edge. However, beyond this simple interpretation, understanding what water *does* and *how* it operates requires a more thorough

investigation. While available GIS maps provide a static and partial representation of the hydrographic system, they fail to capture water's agencies and ever-changing intensities, rhythms, and cycles. Fieldwork, however, helped reveal the river's ever-changing nature, exposing its shifting behaviours and trajectories through the four seasons. Rainwater is a key driver of natural hazards, destabilizing rock and soil and triggering rockfalls, landslides, and floods. As it interacts with the mountain, it reshapes its materiality and texture, generating both gradual transformations and sudden geohazards. Understanding these processes thoroughly requires examining water's varying scales and movements and acknowledging its invisible processes within the rock, its silent processes related to weathering, and its winding trajectories through the rocky mantle. It also involves understanding where water accumulates—in the form of thick stretches of snow on the summits—and the erosion of riverbanks caused by the torrent.

A hydro-morphological perspective is essential for understanding the movement and dynamics of natural phenomena, their cyclical nature, and the seasonal rhythms that shape the landscape. By examining the various forces of water, the watershed emerges as a fundamental notion for reading such a landscape. Hence, it captures both the slow, large-scale transformations unfolding over millions of years and the immediate, micro-scale processes—such as chemical changes—that continuously reshape the environment.[36] As such, the watershed serves as a framing idea that embraces the multifaceted and polyvocal agencies of water, and enables us to engage with the complex agencies of water, rain, ice, and snow. Understanding water's processes, conceptualized as a *watershed*, makes it possible for us to comprehend how water functions and behaves, driven by its own processes and logic.

Landscape architect James Corner regards the notion of *force* as essential for grasping the dynamic processes that shape urban environments and for developing methods to work with and redirect these forces within the practice of landscape urbanism.[37] I argue that this conceptual framework, which emphasizes dynamic processes, is equally relevant beyond urban contexts, particularly in hazardous environments. In this respect, using the notion of *force* helps translate geological processes into movements by breaking away from the binary distinction between static and dynamic—between what lives and moves, and what seems immutable and fixed. I propose using this concept as a key to interpreting the landscape, which leads me to consider *rocks* as another significant force.

Navigating the valley's precarious slopes requires careful attention, as each step is taken amid scattered stones. Walking through this rocky, steep-sided landscape, particularly on the lower reaches of the slopes, one often encounters large blocks of stone that have detached from the steep rock faces above. These areas are characterized by eroded rock formations that have been shedding material since the last Ice Age, leading to the accumulation of scree on the former valley floor. As a result, significant portions of the landscape consist of unstable soil composed of several metres of scree material. The mountain is constantly in motion. It is a force that is not easy to decipher, as most of the processes are invisible to the naked eye and inscribed in deep time.[38] Understanding phenomena such as rock avalanches or landslides requires a comprehensive vertical reading of the mountain slopes—from its peak to the valley floor.

This approach, where the transect assumes full significance, involves interpreting the landscape by examining the subsoil through the lens of geological tools and knowledge. Initially conceptualizing stability (geology) and dynamics (geohazards) as distinct categories (from a landscape architectural perspective) proved inaccurate. Indeed, discussions with fellow researchers in geology revealed that geology encompasses a continuum of phenomena rather than rigid categories. Drawing inspiration from geologist Marcia Bjørnerud, I found that describing rock processes is essential for acquiring geological knowledge. She emphasizes how the use of active verbs connects geological processes to tangible evidence of ongoing movements and transformations.[39] In this way, rocks *fracture, detach, slide, roll, crumble*, and *accumulate*—actions that not only animate descriptions of natural processes but also capture the complexity and vitality of landscapes. Reclaiming this use of active verbs as a vocabulary to describe a site—and favouring the language of landscape and geography over infrastructural terms—can foster the conceptualization and materialization of the forces at play, as well as a recognition of nonhuman landscape agencies.[40] This approach, as advocated by landscape architect Anuradha Mathur, challenges the term *risk*, which inherently carries an anthropocentric perspective through treating natural events as 'intrusions'.[41]

Beyond the influence of rocks, goat herds grazing across pastures and occasionally moving through forest undergrowth reveal a more sensitive and nuanced crafting of the landscape. Their presence exemplifies a dual role: as nonhuman agents with distinct behaviours and as entities significantly

influenced by human interactions. This duality positions goat herds as an intriguing force within the landscape: Through their grazing patterns, they maintain essential open grasslands that emerge between rocks and forests, which are valued locally as the core of the cultural landscape. The forest, too, represents a significant force in Undredal's landscape. Historically impacted by human activities, the forest is now beginning to assert itself as a more autonomous entity. Understanding the factors driving its expansion and behaviour deserves attention, as this could offer valuable insights, including the forest's potential role in mitigating rockfalls.

Hence, in Undredal, the notion of force proved crucial for grounding the study in the specificities of the site. It encouraged a multiscale perspective that intertwines the underground with site observations, weaving together hydrology, geology, and landscape reading. Deciphering the forces at play in such a dynamic landscape makes it possible to recognize the intrinsic logic and agency of nonhuman agencies and move beyond a solely anthropocentric approach. James Corner argued that 'productive, engendering strategies necessitate a prosaic concern for how things work, what they do, how they interact, and what agency or effects they might exercise over time'.[42] His perspective emphasizes that landscapes are never truly static, highlighting the constant interplay of processes and the change and activity that define natural phenomena. I thus suggest viewing Undredal's landscape as a web of ongoing forces, where, despite recognizing the significance of long-term and geological time, site reading paradoxically becomes an interpretation of 'a snapshot of one moment of a myriad of processes'.[43]

Lastly, understanding landscape as an interplay of different forces opens the way to addressing the frictions between pastoralism and natural phenomena. The notion of force, as it does not imply a hierarchy between nature and culture—the *natural* geomorphological environment and the *cultural* pastoral practices—makes it possible to acknowledge the trajectories, needs, and vulnerabilities of goat herding (as the key cultural practice), while simultaneously recognizing the underlying logic and agencies of natural processes. Such a perspective, to me, seems critical in developing strategies that work *with*, rather than *against*, these dynamic processes. As Simon Dixon suggests, instead of attempting to tame or constrain these processes, it may be more effective to embrace a 'dynamic landscape, where the anthropogenic and natural coexist in harmony, where the natural landscape shifts and reform around and within the site'.[44]

2. Unravelling Interwoven Relationships

Conversations with locals have revealed that herders actively utilized and maintained the alder forest for centuries through logging—both for heating needs and for the cheese-making process. This exploitation continued until electricity was introduced in the 1970s in summer pasture farms—called *sel* in the local dialect or more broadly *sæter* in Norwegian. The forest has subsequently regenerated unhindered and expanded significantly. Furthermore, a milder climate has further facilitated the upward progression of the forest on the higher parts of the slopes. Hence, cartographic analysis and aerial photo comparisons distinctly illustrate a substantial increase in forest cover over the past five decades. Moreover, summer fieldwork provided an opportunity for relationships between goat transhumance and the forest in the valley to unfold. It became evident that goat herds make extensive pauses in the alder forest to graze on the undergrowth, selecting vegetation and thus contributing to the maintenance of this habitat. Consequently, the processes of goat herding significantly influence the evolution of the Undredal forest. This dynamic reflects a complex interplay between the two forces at play—goat herding and the forest itself—between human-driven intentions and environmental processes. This understanding adds complexity to the simplistic view of forest development as a purely natural process, driven solely by a

Figure 3. Assemblage of documents investigating the transcription of the forces of the watershed: Hand-drawn map at the scale of the watershed showing the different movements and states of water and details from a collection of photographs capturing the diverse behaviours of the river. Source: the author

milder climate and a decline in the number of farms. This anecdote highlighted the importance of uncovering goat herding agencies and how they interact with other forces. Here, the forest is understood not in isolation, but rather as part of a system intertwined with a complex web of relationships that actively shape and redefine it over time.

Examining such interrelationships within the landscapes makes it possible to understand interwoven, ongoing processes and reveals the interconnectedness of cultural and natural dynamics. This understanding became especially relevant as the research team plans to examine how forest might serve as a natural buffer that mitigates rockfalls and landslides and protects the valley floor. The interweaving of anthropogenic and natural processes within Undredal's forests aligns with Jane Wolff's concept of 'ecological hybrids', which encapsulates the complex relationships between natural phenomena and human activities.[45] Wolff highlights their ongoing interplay, emphasizing their influence on the landscape, and argues that 'the cumulative exchanges between and amongst them produce circumstances where it becomes impossible to draw a line between nature and culture, between economy and ecology, and sometimes even between categories that seem as clear as land as water'.

Uncovering such an intricate interweaving of hybrid relationships necessitates a profound and specific understanding of ecology: Corner advocates for a more sophisticated ecological awareness, a 'culturally animate ecology', based on an understanding that human activities and cultural practices significantly influence ecological processes.[46] This perspective also underscores the need for landscape architects to work with other disciplines—and, specifically, the earth sciences in such unstable environments—so as to deepen their research and analytical skills and thus address the many often-intangible aspects of a site.[47] Beyond merely understanding species (plants, animals, rocks), the focus shifts from describing environments towards emphasizing interrelations and, recognizing their crucial 'in-betweenness', towards identifying and naming the relationships between elements.[48] By echoing the interwoven and multilayered ecologies that shape a site—and, to a greater extent, a hazardous environment—Tim Ingold's conceptualization of the landscape as a 'meshwork of relationships' offers a valuable framework for understanding them.[49] However, in the context of Undredal, the term *interwoven relationships* may offer a more nuanced and dynamic perspective. Indeed, the term *weaving* emphasizes the continuous and iterative interactions between natu-

ral elements and human activities, thereby emphasizing the idea that these interrelationships have agencies.

Reading sites 'as an adventure of relationships' and articulating some of these relations at play in order to communicate them to others for consideration has been described as a crucial mission for landscape architecture practice, especially in the challenging era of the Anthropocene.[50] This approach challenges traditional separations between human and nonhuman influences, and contributes to expanding the shared understanding of landscape architecture as a practice of mediating between humans and the environment which must be grounded in an attitude of 'extreme sensitivity and empathy for all human and nonhuman aspects of a given site'.[51]

3. Noticing Community Attachments

The Undredal landscape, shaped over centuries by pastoral practices on a demanding steep terrain, embodies a vernacular landscape profoundly

Figure 4. The relationship between rocks (from past landslides) and the construction of low stone walls is one of the intriguing interplays between natural hazards and the shaping of the cultural landscape. Photo from summer 2023. Source: the author

influenced by community involvement, thus reflecting the enduring connection between the community and this environment. As an example of the community's attachments to its landscape, the Undredal community Facebook group is a rich ethnographic resource.[52] This virtual social space bears witness to the sensitive and lived dimensions of the entire valley, confirming that the valley is indeed *the site* that holds significant value for the community. Social media posts about Undredal reflect attachments that span the entire valley—from the high steppe plateaus, where traditional hunting practices still thrive, down to the seashore.

Beyond the strictly physical aspects, this profound dimension reveals attachments and meaning—a relational dimension shaped by people's connections to *their* territory. As examples, the Facebook group's content illustrates how hiking trails are collectively maintained through community efforts and are used in the summer to reach mountain peaks and pastures. The old transhumance route (*Gamleveien*), which was once the only path running along the valley floor, is another landscape element that evokes strong connections through care and frequent restoration work. Additionally, social media shed light on the intricate routes taken by goats during transhumance and the complex seasonal organization of summer grazing: Goat herding has indeed inspired numerous personal accounts—videos and stories shared on social networks and on the websites of dairies—which highlight, for instance, the meticulous manual management of the meadows, where hand-mowing becomes a demanding summer ritual on steep slopes. The comments and discussions demonstrate that stewardship is not merely about preservation but is deeply rooted in emotional bonds with the land. These accounts showcase emotional ties intertwined with knowhow and skills, echoing the fact that landscapes are not static scenes but are actively shaped and maintained through human activities, engagements, and affective ties between communities and their environments.[53]

According to Ingold, interwoven *skills* create a complex and multifaceted landscape and contribute to the overall texture of the landscape.[54] In Undredal, the community's skills—viewed as a network of interactions between humans and goat herds—are essential for understanding the processes that have crafted the landscape and how adaptation to the hazardous environment has been achieved over time. This view aligns with Anne Whiston Spirn's concept of *landscape literacy*, which underscores the importance of understanding the stories and immaterial layers that shape landscapes in

order to make informed decisions in landscape design and preservation. [55] Attachments are, therefore, integral to the cultural dimensions of the landscape, a perspective that holds particular significance in this context of an unstable landscape becoming increasingly vulnerable to natural hazards.

4. Unfolding More-than-Human Socialities

Beyond the intimate commitment of local inhabitants to crafting their landscape, the Undredal case has demonstrated the importance of examining their relationships with nonhuman entities like the river and the mountain, especially in a context where lifestyles are closely intertwined with natural forces. In such an unstable environment, particular attention to how locals perceive natural hazards seemed essential. Given the new unpredictability of the mountain and the modified natural hazards regime, I am curious to understand how feelings towards the mountain will change over time. What affects and relational modes bind these inhabitants to these disruptive agents,

Figure 5. Discussions of the trajectories of goat breeding, supported by maps, archival photographs from the early twentieth century, and a physical model, took place during the first community workshop in November 2023. Source: the author

particularly the herders who live and work in the landscape? These questions were central in the discussions during the first community workshop, which brought together the *Naturact* team and the community.[56] Discussions, some enriched by interviews, revealed that the community maintains serene feelings towards the mountain, even as they fully integrate an awareness of its risks into their daily lives.[57] The mountain's instability does not evoke much fear. Many residents mentioned that when rockfalls are frequent in spring, they keep a watchful eye on the mountain slopes while driving through the valley. What I, as well as the team members, viewed as a risky practice was, in reality, experienced merely as a minor inconvenience, leading only to heightened vigilance.

In the interviews with a mountain herder and a shepherdess, the term *notice* to describe their habit of deciphering the mountain and its potential dangers was frequently used. It appeared that their situated knowledge, grounded in experience of the terrain and careful daily observation of meteorological factors—such as a wind direction that triggers avalanches—enables them to navigate the inherent uncertainties of their environment. However, upon witnessing the impactful images of the 2014 flood in Undredal, I began to question the emotions and attachments residents have towards the turbulent torrent. Conversations with locals revealed a sense of apprehension regarding the principal river, the Undredalselvi. Interviews provided further insights into the constant vigilance maintained by those living along its banks. They have learned to detect changes in the river's behaviour by observing the water stream's movements. One informant noted that, during heavy rains, he would give special attention to the sounds of stones rolling in the riverbed, which provide him with clues about the river's velocity. These noises help him gauge the intensity and rhythm of the river flow, even in the darkness of night. 'When the river starts to roll', he said, the noise often disrupts his sleep, triggered by anxiety over potential flooding.[58] This inhabitant's descriptions portrayed the river as a living entity akin to a person or an intimate neighbour. During the conversation, a deep and complex form of *social* relationship unfolded between the individual and the river, one of attachment, fascination, and fear. These findings have enabled me to expand the notion of attachments to nonhuman beings such as rivers, rocks, and forests, echoing Anna Tsing's notion of *more-than-human socialities*.[59] Her ideas explore the intricate connections and collaborations between humans and nonhuman entities within ecosystems and landscapes. More-than-human socialities focus on the underlying relationships that connect nonhuman species with

one another, as well as with humans. She emphasizes that understanding and addressing environmental change and landscape transformation requires recognizing that humans are part of a larger community of beings, all of which shape their environments collectively. Hence, she calls for engaging with *critical description*,[60] thereby inviting landscape architecture practice to restore the intrinsic value of ethnographic work for a renewed sensitivity to what constitutes a site.

Beyond the strictly physical dimension of the cultural landscape lies a more profound dimension that reveals multiple attachments. This relational dimension of a landscape must be invoked in adaptation efforts because it recognizes that risk is not just a physical phenomenon but also a *social* and *cultural* one.

Figure 6. Stones in the riverbed near the home of a resident who described how he notices the sound they make as water levels rise. The image also reveals signs of erosion. Photo from December 2023. Source: the author

CONCLUSION

This study seeks to address the intertwined dimensions of natural hazards and cultural practices within hazardous landscapes. Unravelling the complex relationships that have gradually evolved over centuries between cultural practices and natural phenomena in such a vernacular environment involves examining how they interact, as well as their dynamics and tensions. The study thus explores methods for acknowledging the multiple layers of a hazardous site and proposes four strategies for reading the site that suggest entry points to understanding unstable mountain landscapes: Firstly, building on geological and hydrological expertise, deciphering the landscape through the lenses of its *forces* provides a closer reading of dynamics and landscape agencies inscribed in an understanding of geomorphological cycles and multiscale processes. Secondly, unravelling the multiple *interwoven relationships* that bind these forces facilitates a process-based understanding of how these agencies collaborate and interact. Finally, noticing the *community attachments* and *unfolding more-than-human socialities* integrates the social and emotional components of the landscape, recognizing the complex interconnections between communities and their environment in a time of rapid and uncertain changes.

The study provides various insights into how landscape architects can engage in intensive interdisciplinary collaborations to achieve a comprehensive understanding of hazardous cultural landscapes by weaving together different forms and sources of knowledge. Hence, they may play a crucial role in bridging situated knowledge from communities and scientific expertise together through diverse forms of field-based engagement and collaboration. The study, thereby, highlights the ability of landscape architects to act as *mediators*[61] between disciplines and their capacity to contribute to knowledge creation. Through underscoring the importance of comprehending the multiple facets of large landscapes, the study highlights the importance of landscape thinking and interdisciplinary collaboration, and the potential of a still-emerging more-than-human perspective in climate action. Such a recognition of the intrinsic agencies of nonhuman forces opens up opportunities for refining anthropocentric perspectives in adaptation strategies, thus challenging the objectified relation to natural entities that often prevail in risk management.

However, further—particularly practice-based—research is needed to investigate how a more-than-human approach to site knowledge production

could inform the design of adaptation strategies *in practice*. Could such a perspective foster new negotiations between human and nonhuman interests with respect to climate adaptation, following calls to recognize nonhuman entities as 'partners,'[62] meaning actors with their own rights? This approach would align with scholarly arguments emphasizing the need for practitioners to enhance their focus on human-nature mediation in the face of urgent climate change challenges.[63]

Continued exploration of more-than-human approaches to our rapidly changing landscapes and territories is essential to develop balanced responses that negotiate between human and nonhuman interests and trajectories. As this field is still emerging, we must further investigate how such mindful and caring approaches and perspectives can contribute to managing hazardous landscapes. To this end, the greater involvement of landscape architects in large-scale adaptation projects is essential, particularly in Norway's mountainous regions.

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NOTES

[1] This description is taken from a geotechnical report titled 'Faresoneutredning skred i bratt terreng—Aurland kommune' (Hazard zone assessment of landslides in steep terrain—Aurland municipality), translation from Norwegian by author; Norges vassdrags og energidirektorat, 'Faresoneutredning skred i bratt terreng– Aurland kommune' (2023), p. 750.

[2] Karen Lykke Syse, 'Hefting the Land: A Locative Heritage of Hooves and Feet', in Katarina Saltzman, Daniel Svensson, and Sverker Sörlin (eds.), *Pathways: Exploring the routes of a movement heritage* (Winwick, Cambridgeshire: White Horse Press, 2022), pp. 97–113.

[3] Iselin Rønningsbakk, 'Klimaendringer vil føre til våtere vær på Vestlandet', https://cicero.oslo.no/no/artikler/klimaendringer-vil-fore-til-vatere-vaer-pa-vestlandet [all URLs here accessed in April 2025].

[4] Western Norway was hit by a major flooding event on 27–29 October 2014. The flooding was caused by heavy rainfall over a three-day period totalling 200–300 mm of rain over large areas. The extent of the damage was very significant, with reportedly more than 1,000 properties damaged, in addition to extensive damage to infrastructure. Source: https://publikasjoner.nve.no/rapport/2015/rapport2015_11.pdf.

[5] Interview with a goat breeder conducted in August 2023 and a community engagement workshop in November 2023.

[6] The term 'thick description', originally coined by anthropologist Clifford Geertz, refers to a simple interpretive ethnographic approach. It has often been used and reinterpreted in landscape architecture to address issues around site analysis, as explained by Alison Hirsch. Scholar and landscape architect James Corner has, for example, adopted Geertz's notion of 'thick description' multiple time. See Clifford Geertz, 'Thick Description: Toward an Interpretive Theory', in idem (ed.) *The Interpretation of Cultures: Selected Essays* (New York: Basic Books, 1973), pp. 3–30.

[7] Alison B. Hirsch, 'Expanded "Thick Description": The Landscape Architect as Critical Ethnographer', in D. Ortega Anderson (ed.), *Innovations in Landscape Architecture* (London: Routledge, 2016).

[8] Jane Wolff, 'Lexicon as Theory: Some Definitions at the Edge of San Francisco Bay', in Christophe Girot, Susann Ahn, Isabelle Fehlmann, and Lara Mehling (ed.), *Delta Dialogues*, pamphlet 20 (Zurich: gta Verlag, 2017), p. 16.

[9] The *Naturact* research project (2021–26) is funded by the Research Council of Norway and is based on three Norwegian case studies.

[10] The author is one of the three landscape architects in the *Naturact* team.

[11] According to the International Federation of Landscape Architects (IFLA), Nature-based Solutions (NbS) are defined as actions that work with nature to address societal challenges such as climate change, disaster risk reduction, and improving urban resilience. These solutions are grounded in the understanding that healthy ecosystems and natural processes can provide sustainable benefits to both people and the environment.
See International Union for Conservation of Nature 'Nature-based Solutions', https://www.iucn.org/our-work/nature-based-solutions.

[12] The research project aims to provide valuable insights into other Norwegian mountain and inland regions—cultural landscapes shaped by pastoral practices.

[13] In Norway, risk assessment maps are tools used to identify and evaluate potential hazards related to natural phenomena such as landslides, floods, and avalanches. These maps are used

for planning and managing land use. They are typically produced by various organizations, including the Norwegian Geological Institute (NGU), the Norwegian Water Resources and Energy Directorate (NVE), and the Norwegian Geotechnical Institute (NGI).

[14] Interview with a goat breeder on 8 December 2023.

[15] Simon Dixon, 'Landscape Processes as Site Context', in Andrea Burns and Carol J. Kahn (ed.), *Site Matters: Strategies for Uncertainty Through Planning and Design*, 2nd edn. (London: Routledge, 2020).

[16] Ellen Braae, Ellen (2017), 'Approaching the "As found"', in Christophe Girot, Susann Ahn, Isabelle Fehlmann, and Lara Mehling (ed.), *Delta Dialogues*, pamphlet 20, (Zurich: gta Verlag, 2017), p. 47.

[17] Ian McHarg, *Design with Nature* (New York: Natural History Press, 1969).

[18] Michel Corajoud, *Le paysage, c'est l'endroit où le ciel et la terre se touchent* (Arles: Actes Sud, 2010).

[19] Andrea Kahn and Carol J. Burns, 'Why Site Matters?', in idem (ed.), *Site Matters: Strategies for Uncertainty Through Planning and Design*, 2nd edn. (London: Routledge, 2020), p. 5.

[20] Braae, 'Approaching the "As found"', p. 47.

[21] Kate Orff, *Toward an Urban Ecology* (New York: The Monacelli Press, 2016).

[22] Kevin Lynch and Gary Hack, *Site Planning*, 3rd edn. (Cambridge, MA: The MIT Press, 1984).

[23] James A. LaGro, *Site Analysis: A contextual approach to sustainable land planning and site design*, 2nd edn. (Hoboken, NJ: John Wiley & Sons, 2008).

[24] Kahn and Burns, 'Why Site matters?', p. 11.

[25] Christophe Girot, 'Four Trace Concepts in Landscape Architecture', in James Corner (ed.), *Recovering Landscape: Essays in Contemporary Landscape Architecture*, 6th edn. (New York: Princeton Architectural Press, 2009), p. 63.

[26] The team workshop took place on 9–11 May 2023 and brought together eleven team members from eight disciplines: two geotechnical-engineers, one geologist, one hydrologist, three landscape-architects, one system-designer, one architect and cultural heritage expert, and two terrestrial ecosystem ecologist and land surface modellers.

[27] The landscape's cycles and dynamics, particularly the striking variations in the hydrographic network, revealed their importance, with seasonal and climatic changes significantly influencing its evolution.

[28] Pascal Aubry, Pierre Donadieu, Arnauld Laffage, Jean-Pierre Le Dantec, Yves Luginbühl, and Alain Roger, *Mouvance II, soixante-dix mots pour le paysage*, ed. Augustin Berque (Paris: Editions de la Villette, 2006).

[29] Henrik Schultz, 'Designing large-scale landscapes through walking', *Journal of Landscape Architecture* 9 (2014), pp. 6–15.

[30] The two workshops were held a few weeks apart at the end of 2023 and took place in the local café in Undredal village.

[31] Donna Haraway, 'Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective', *Feminist Studies* 14/3 (1988), pp. 575–99.

[32] The *more-than-human* ontological turn refers to a shift in philosophical and interdisciplinary thought that challenges anthropocentric perspectives, emphasizing the agency, interconnectedness, and intrinsic value of nonhuman beings. It explores how the social and natural worlds are co-constituted by humans, animals, objects, and other nonhuman actors, thus urging a rethinking of ontology beyond human-centred frameworks. Ecologist and philosopher David Abram was one of the first authors to describe more-than-human worlds, in his book *The Spell of the Sensuous: Perception and Language in a More-Than-Human World*, and Sarah Whatmore is one of the scholars often associated with the *more-than-human turn* in spatial disciplines. In the last decade, more-than-human approaches have gained influence in the landscape discipline. Several landscape architectural scholars have provided the discipline with theories, approaches, and methods to engage with more-than-human landscapes. See Sarah Whatmore, 'Materialist returns: Practising cultural geography in and for a more-than-human world', *Cultural Geographies*, *13*(4) (2006), pp. 600–09. http://www.jstor.org/stable/44251128.

[33] Baptiste Morizot, *Manières d´être vivant* (Mondes Sauvages; Arles: Actes Sud, 2020), p. 336.

[34] Philippe Descola, 'Beyond Nature and Culture', *Proceedings of the British Academy*, *Volume 139, 2005 Lectures* (Oxford: Oxford University Press, 2006), pp. 137–55; and idem *Une écologie des relations* (Paris: CNRS Editions, 2019).

[35] Martin Prominski, 'Designing landscapes of entanglement', in Ellen Steiner and Henriette Braae (ed.), *Routledge Research Companion to Landscape Architecture*, 1st edn. (London: Routledge, 2018).

[36] *Les zones critiques et la redéfinition de la notion de territoire*, conference by Bruno Latour at the Collège de France, 2015, http://www.bruno-latour.fr/node/650.html.

[37] James Corner, 'Terra Fluxus', in James Corner and Alison Bick Hirsch (eds.), *The Landscape Imagination: Collected Essays of James Corner, 1990–2010*, 1st edn. (New York: Princeton Architectural Press, 2014), pp. 21–33.

[38] Marcia Bjørnerud, *Reading the rocks: The autobiography of the earth* (Cambridge: Westview Press, 2005).

[39] Marcia Bjørnerud, *Timefulness: How Thinking Like a Geologist Can Help Save the World* (New York: Princeton University Press, 2018).

[40] Anuradha Mathur, 'Terrains of Wetness', in Christophe Girot, Susann Ahn, Isabelle Fehlmann, and Lara Mehling (ed.), *Delta Dialogues*, pamphlet 20 (Zurich: gta Verlag, 2017), p. 62.

[41] Mathur, 'Terrains of Wetness'.

[42] James Corner, 'Eidetic operations and new landscapes', in idem (ed.), *Recovering Landscape: Essays in Contemporary Landscape Architecture* (New York: Princeton Architectural Press, 1999), pp. 152–69.

[43] Dirk Sijmons, 'In the Anthropocene, Site Matters in Four Ways', in Carol J. Burns and Andrea Kahn (eds.), *Site Matters, Strategies for Uncertainty Through Planning and Design*, 2nd edn. (London: Routledge, 2020), p. 120.

[44] Simon Dixon, `Landscape Processes as Site Context´, in Carol J. Burns and Andrea Kahn (eds.), *Site Matters, Strategies for Uncertainty Through Planning and Design*, 2nd edn. (London: Routledge, 2020), p. 108.

[45] Jane Wolff, 'Lexicon as Theory: Some Definitions at the Edge of San Francisco Bay', in Christophe Girot, Susann Ahn, Isabelle Fehlmann, and Lara Mehling (ed.), *Delta Dialogues*, pamphlet 20 (Zurich: gta Verlag, 2017), p. 15.

[46] James Corner, 'Ecology and Landscape as Agents of Creativity', in James Corner and Alison Bick Hirsch (eds.), *The Landscape Imagination: Collected Essays of James Corner, 1990–2010*, 1st edn. (New York: Princeton Architectural Press, 2014).

[47] Christophe Girot, 'Four Trace Concepts in Landscape Architecture', in James Corner (ed.), *Recovering Landscape: Essays in Contemporary Landscape Architecture*, 6th edn. (New York: Princeton Architectural Press, 2009), pp. 58–67.

[48] Martin Prominski, 'Andscapes: Concepts of nature and culture for landscape architecture in the 'Anthropocene', *Journal of Landscape Architecture* 9/1 (2014), pp. 6–19.

[49] Tim Ingold, *The perception of the environment: Essays on livelihood, dwelling & skill* (London: Routledge, 2000).

[50] Martin Prominski, 'Andscapes', pp. 6–19.

[51] Dirk Sijmons, 'In the Anthropocene', p. 122.

[52] *Underdøler og Underdal* is a private Facebook group dedicated to the Undredal community with about 100 members.

[53] Ingold, *The perception of the environment*.

[54] Ingold, *The perception of the environment*.

[55] Anne Whiston Spirn, *The Language of Landscape* (New Haven, CT: Yale University Press, 1998).

[56] The first community workshop, on 3 November 2023, brought together twelve inhabitants and four members of the research team.

[57] Semi-structured interviews with two goat breeders, 8 December 2023.

[58] Semi-structured interview with a local inhabitant, 8 December 2023.

[59] Anna Tsing, 'More-than-Human Sociality: A Call for Critical Description', in Kirsten Hastrup (ed.), *Anthropology and Nature*, 1st edn. (New York: Routledge, 2013), pp. 27–42.

[60] Tsing, 'More-than-Human Sociality'.

[61] Jean-Marc Besse, *La nécessité du paysage* (Marseille: Parenthèses, 2018), p. 120; Sonia Keravel, *Passeurs de paysage : Le projet de paysage comme art relationnel* (Geneva: Metis Presses, 2015); Hironao Kawai, 'Landscape Architect as "Mediator"—A Cultural Anthropological Perspective', *Landscape Architecture Frontiers* 5/2 (2017), pp. 56–61.

[62] Descola, *Une écologie des relations*.

[63] Sijmons, 'In the Anthropocene', p. 308.

RETHINKING THE PLACE QUALITIES AND CULTURAL HERITAGE OF IN-BETWEEN CITIES

Vignir Freyr Helgason

ABSTRACT

The current planning of urban environments in Norway adheres to a compact city model that aims to develop place qualities similar to those found in the central areas of larger cities. This article examines the dynamics of preservation and development from a planning and heritage perspective through Thomas Sieverts' concept of the 'in-between city' ('Zwischenstadt'), in which he rejects conventional rural-urban classifications by highlighting areas with often-overlooked qualities. The rapidly transforming Norwegian municipality of Lørenskog, adjacent to the capital of Oslo, was selected as a case study. A critical document analysis of Lørenskog's municipal and Cultural Heritage Management Plan reveals a narrow, material-focused interpretation of heritage, which is echoed in related local and regional plans and strategies. The study reveals that, in planning, cultural heritage is often confined to material objects and designated areas, thereby limiting understanding and a possible broader impact in contemporary urban planning and development. The findings call for a re-evaluation of the potential role of cultural heritage in shaping the place qualities of an in-between city. The article proposes that heritage and development be rethought as an integrated approach that includes understanding places like Lørenskog as a cultural landscape. Such a shift highlights the need for a more comprehensive mapping of heritage in urban planning and development that includes the perspectives and experiences of local communities.

KEYWORDS

place quality, 'Zwischenstadt', cultural heritage, historic urban landscape approach (HUL)

THE CULTURAL HERITAGE AND PLACE QUALITIES OF IN-BETWEEN CITIES

Over the last few decades, Lørenskog, a Norwegian municipality in the periphery of Oslo, has undergone rapid densification and the development of a landscape previously characterized by agriculture. Planning of urbanized environments in Norway, such as Lørenskog, follows a compact city model that aims for urban qualities similar to those found in the central areas of larger cities. Over the past two decades, many European urban strategies and policies have aimed at developing attractive cities and made 'place quality' an integral focus.[1] However, the development outcomes, such as those experienced in the case of Lørenskog, have raised concerns among residents and prompted calls to halt further development.[2] The article therefore explores the concept of place quality, its role in planning, and its relationship to cultural heritage.

In the *Encyclopedia of Quality of Life and Well-Being Research* (2014), landscape architect Mel Burton explains place quality as 'the physical characteristics of a community—the way it is planned, designed, developed and maintained—that affect the quality of life of people living and working in it, and those visiting it, both now and into the future'.[3] According to Richard Florida's definition in his book *The Rise of the Creative Class* (2002), place qualities refer to an interrelated set of experiences and characteristics that make a place attractive.[4] Florida proposed to make those qualities an aim in planning and development to attract people in the creative class and boost economic activity. A later contribution to the theorization of the concept of place quality is found in Matthew Carmona's book *Public Places Urban Spaces—The Dimensions of Urban Design* (2021), which criticizes the failure of developers to respond to the local needs and wishes of people regarding place experiences.[5] Carmona introduces a broader definition of place qualities, extending beyond economic value to include cultural and use value, which is related to peoples identities and facilitates opportunities for social activities.[6] The definitions provided by Burton, Florida, and Carmona, however, favour a compact urban form. Their theories, grounded in studies of historical urban centres, can limit other forms and qualities found in the peripheries of larger cities.[7] To overcome these limitations, this article will use the concept of the 'Zwischenstadt', the 'in-between city', to explore the topic. German urban planner and architect Thomas Sieverts (2003) proposed this term to challenge the traditional dichotomy between the countryside and the city—and uses it for places that are neither entirely urban nor rural.

With his concept, Sieverts advocates for an urban landscape that defies categorization and can exist and be studied from a locally situated perspective.

The article relates the situation in Lørenskog to the discussions of qualities as described in the *Davos Declaration 2018*. This declaration, signed by the European Ministers of Culture, sheds light on an international political and cross-disciplinary professional debate on the ongoing European trend concerning a loss of quality in both open landscapes and the built environment.[8] It acknowledges that urban centres of big cities and smaller towns in Europe are protected, whilst the built environment elsewhere is trivialized and characterized by careless urban sprawl. The declaration suggests that built environment should be understood as culture and, simultaneously, as a space for culture. To achieve a high-quality 'Baukultur', the declaration advocates for a holistic and interdisciplinary approach in which heritage perspectives are integrated into planning and development. Addressing the loss of qualities in the built environment is crucial because this significantly influences individuals' well-being and quality of life.[9] Built environments provide more than physical structures; they impact daily experiences, affect possibilities for social connections, and contribute to a sense of identity and belonging.[10] Although the intentions in the declaration are clear, it nevertheless does not provide solutions for how planning can support this type of holistic development. There is therefore a need to further investigate how integrating heritage and planning approaches can help remedy the loss of quality in peripheral places.

Considering the changing notions of cultural heritage and limited understanding of place qualities, which do not address the individual characteristics of in-between cities, this article aims to contribute to rethinking and expanding the concept of place quality. It discusses how a heritage perspective can open up a new understanding of the planning and development of place qualities. Before introducing the case study as a research approach, the following sections will first discuss how the article intends to engage with the topic and further explain why the in-between city concept was chosen in connection with rethinking place qualities.

UNDERSTANDING IN-BETWEEN CITIES

With the expansion of cities following the first industrial revolution in the nineteenth century, there came a need to rethink situations in the peripheral territories between what was understood as the city and the country-

side.[11] Nineteenth- and twentieth-century scholars debated whether the countryside was better suited for living than the city. Essential works in this regard are Herbert George Wells's *The Urban Region* (1901), Patrick Geddes's *The City-Region* (1915), and Frank Lloyd Wright's *Broadacre City* (1932). The common thread in these publications is the recognition of the interdependence between cities and the landscapes surrounding them. Each work emphasizes that peripheral regions—such as suburbs, rural areas, and natural landscapes—are integral to the urban whole, thus challenging earlier notions that treated cities as isolated entities. Later writings that addressed this expansion of cities include *The Diffuse City* (*La Città Diffusa*) by Italian urban planner Francesco Indovina (1990) and *Cities Without Cities—An Interpretation of the Zwischenstadt* by German architect and urban planner Thomas Sieverts (2003). Both describe places in the peripheries of bigger cities typically characterized by scattered developments.[12] These texts presented new ways of interpreting changes outside of historic cities. In Martina Barcelloni Corte and Paola Viganò's *The Horizontal Metropolis: The Anthology* (2022), Sieverts and Indovina were given an opportunity to evaluate their contributions through interviews and to reintroduce the relevance of their ideas to tackling contemporary issues.[13] While their concepts of the 'diffuse city' and the 'Zwischenstadt' address different aspects of urban development, they nonetheless share a common concern with the evolving urban landscape, its spatial dynamics, and the challenges posed by uncontrolled growth and spatial inequalities. This article uses the in-between city concept to explore the case of Lørenskog since it provides a clear alternative to the still prevailing binary notions of city or countryside, allowing for a simultaneous exploration of urban and rural characteristics of places in the periphery of larger cities.

MONUMENTS TO CULTURAL LANDSCAPES: EVOLVING NOTIONS OF CULTURAL HERITAGE

Initially, cultural heritage was primarily centred around preserving and showcasing iconic monuments, such as historic buildings.[14] Later, critical heritage perspectives shifted from focusing on monuments to concentrating on users. A significant contributor in this regard is Laurajane Smith with her seminal work *Uses of Heritage* (2006). In the book she critiques contemporary systems of heritage management and how users of heritage are not allowed to define their heritage. She explains that heritage is often identified from a top-down perspective, or what Smith calls the 'authorized heritage discourse'. The cultural heritage discourse has since evolved and is now connected with

architecture and urbanism through shared ties with urban morphology, a field focusing on understanding the urban form of cities that has its roots in studies of historical urban centres.[15] This knowledge has influenced the Norwegian heritage discourse, such as in development of *DIVE—Urban Heritage Analysis*, a participatory-based tool for defining and assessing the value of cultural heritage environments.[16] DIVE builds, amongst others, on Kevin Lynch's book *Image of the City* (1960), emphasizing urban aesthetics and ideals deriving from traditional European urban centres.[17] In recent decades, urban scholars and heritage experts have, however, recognized that a city's heritage extends beyond individual buildings or structures. The urban environment itself, with its layout, streets, public spaces, and social dynamics, contributes to the city's cultural identity and developments within cultural heritage have consequently shifted the focus from individual cultural monuments within cities to viewing entire cityscapes as cultural landscapes.[18]

Over time, the understanding of the historic city has moved from being viewed primarily as a visual object—shaped by architectural practices and urban morphology—to a more experiential perspective informed by social science disciplines such as geography.[19] The Historic Urban Landscape Approach (HUL) is important to this shift. HUL incorporates a broad acknowledgement of urban heritage, including a 'sense of place', a concept rooted in the individuals' experiences and cultural practices that foster attachment to a particular landscape.[20] According to architect Francesco Bandarin and urban planner Ron van Oers, the HUL approach is part of a larger discourse on the evolving relationship between urbanism and cultural heritage that seeks to address some of the complex challenges in contemporary urban planning and development.[21] HUL thus offers a useful interdisciplinary framework for exploring the topic of this article.

THE NEED TO RETHINK THE CONCEPT OF PLACE QUALITY

Within the context of Norwegian urban planning, there is a vast amount of terminology concerning qualities of the built environment, such as 'architectural qualities', 'living qualities', 'urban qualities' and 'place qualities',[22] with differences in how they are defined in planning policies and strategies. The most crucial difference pertinent to this article is that living and urban qualities are based on a normative understanding that describes desired urban and living conditions deriving from non-contextual ideals. Architectural qualities and place qualities can be understood as contextual concepts that emphasize the relationships between built and unbuilt environments and

sociocultural practices. The article therefore focuses on place quality as it appears as an operative term in both policy and practice across planning and heritage contexts.

In *The Rise of the Creative Class*, Richard Florida uses the term 'quality of place' to spatialize the more established concept of 'quality of life'.[23] With his interpretation of the concept, he defined the characteristics of a place that is attractive for inhabitants, visitors, and businesses to sustain economic growth. His concept has been particularly influential and used as an aim in planning policies across many countries.[24] Florida modelled the concept of place quality based on and for a specific kind of urban context, favouring dense urban neighbourhoods in a bigger city rather than the rural character of a small town. Norwegian public authorities' reports and strategies often aim to create urban qualities through compact urban planning and development, based largely on Florida's understanding.[25] The Norwegian term 'stedskvalitet' ('place quality') was included in the Norwegian Directorate for Cultural Heritage's revised strategy and urban and place development recommendations in 2021.[26] In the strategy, the term is described as a concept that involves taking care of and developing qualities in cities and places on the basis of a broad contextual understanding. The term encompasses social communities, nature, local characteristics, and the materiality of the built environment. This explanation of the term opens up a more contextually rich definition that does not fully correspond with Florida's concept and requires further study. The emphasis on historical urban cores in research and urban policy thus calls for investigations of other types of landscapes. This article therefore poses the following questions: How can challenges in the heritage management of in-between cities be understood using Lørenskog as a case study? How can these perspectives enrich our knowledge of place qualities in the planning and development of in-between cities?

THE CASE STUDY AS A RESEARCH APPROACH

I have chosen two qualitative research approaches to study the research topic. One is an overarching case study approach, and the other is a critical document analysis focusing on Lørenskog's new municipal plan. The case study is chosen as the primary research approach because it is well-suited for addressing broad research topics involving contextual variables that require multiple sources of evidence and investigative methods.[27] Regarding the reliance on a single case to inform the study, I find support in Bent Flyvbjerg's article 'Five Misunderstandings About Case-Study Research' (2006),

in which he argues that using a single case can make a valuable contribution to scientific development. Drawing on Flyvbjerg, I have identified Lørenskog as a so-called 'paradigmatic case' because it exemplifies how a vast amount of planning goals and building regulations are put into action within a limited timeframe, making it suitable for revealing current societal trends and characteristics.

Lørenskog municipality was chosen as a case due to the presence of urbanized areas with characteristics similar to Sievert's, previously outlined, 'Zwischenstadt' concept. This article challenges the traditional cultural heritage management perspective by choosing an atypical case. The case is atypical from a heritage perspective since not much heritage has been defined within the municipality's borders. It can therefore potentially inform both planning and heritage management processes beyond what is already known within historical urban centres. The case also has the potential to reveal more critical questions than answers, making it useful in expanding the concept of place quality related to cultural heritage.

Flyvbjerg claims that practical knowledge is just as valuable as theoretical knowledge.[28] In approaching the case, I therefore draw on my practical and professional background as an architect, planning consultant, and heritage advisor. I engage with the case in multiple ways, including field studies, analysis of maps, and an exploration of planning discourses. For instance, through attending public presentations related to the new municipal plan, which is examined later in this article. In investigating Lørenskog, I also undertake a critical document analysis of the new municipal plan. It comprises many planning documents with different purposes ranging from societal and functional planning aspects to economic ones. Document analysis is amongst the most commonly used methods within the humanities, and there are numerous ways of going about it.[29] I draw on social scientist Kennet Lynggård's explanation that document analysis can be used to unravel political or discursive processes. [30] The central focus of my study is on the Cultural Heritage Management Plan, which is divided into three parts.[31] This focus makes it possible to assess how heritage is mapped and managed through local planning and development, and simultaneously to reveal how local planning authorities value heritage within the case study.

In addition, I have collected official reports, strategies and documents that provide examples of how the terms 'urban qualities' and 'place qualities' are

defined and used to guide local and regional development. I deem this important since Norwegian national and regional planning goals heavily guide local planning.[32] Since the concept of place quality is mainly used operationally in planning, these references are important to expand and build theory.

THE CULTURAL HERITAGE AND PLACE QUALITIES OF LØRENSKOG

Lørenskog is a municipality located between Lillestrøm and Oslo. It is currently one of the fastest-growing municipalities in Norway and a place of great diversity, with 140 nationalities represented, the majority of which are from Pakistan, Poland, Vietnam, Sri Lanka, Iran, India, Turkey, and Iraq.[33] The proximity to both Oslo and green spaces makes it an attractive place to live. However, many inhabitants have raised concerns about this rapid change and the increased density in the built environment.[34] When arriving in the centre of Lørenskog, one experiences an environment quite different from a historic city centre. The area has undergone renewal and densification processes in the past few decades and represents an example of how rapid development has changed the morphological appearance and experience of the place. Within newly developed parts of the Skårer area, one encounters a place characterized by wide roads and stark contrasts in materiality, density, and scale by comparison with the surrounding areas. Figure 1 shows how the landscape has become increasingly urbanized over the past fifty years (from 1971 to 2022). The farming landscape that previously characterized the environment has been replaced with an environment with a more urban character, with two shopping centres on each side of the city centre containing the majority of retail functions. A newly established boulevard connecting the two shopping centres leads to the main highway, which links to the city of Oslo and the neighbouring municipality of Lillestrøm. The highway simultaneously divides the municipality of Lørenskog into two parts, north and south.

Lørenskog's economy was primarily based on farming and forestry until the 1980s, when the local politicians decided to move the municipal centre from Fjellhamar in the northern part to Skårersletta in the south.[35] Skårersletta, now known as Skårer, was previously a part of the Skårer farm. The morphological changes in the environment where the farming landscape has been increasingly urbanized are reflected in the removal of 'sletta' from the original name ('sletta' is the Norwegian word for 'plain'). Instead of an open landscape, there is now a densely built-up area. The built environment has

become dynamic in scale, with some of the tallest buildings reaching up to nine storeys. This development has changed the relationship between the built environment and the surrounding landscape; instead of an unhindered

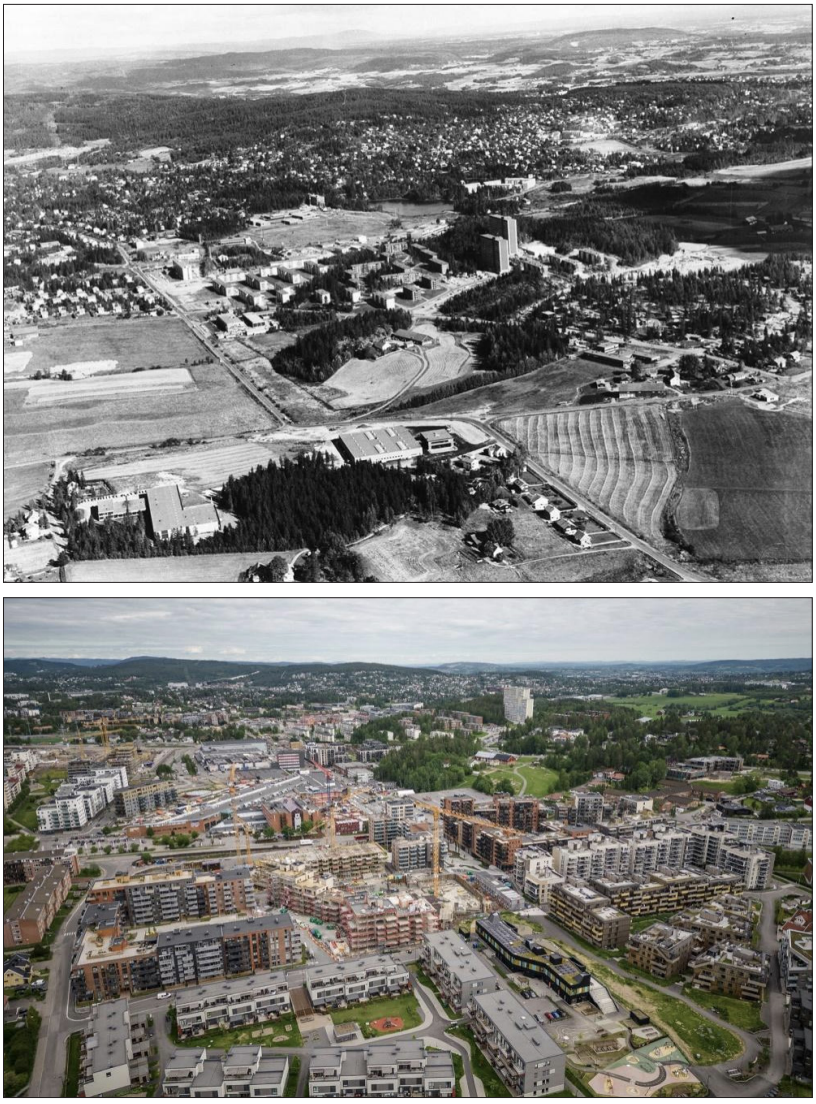

Fig. 1. Photo of the rural plains of Skårersletta in 1971 (© Museene i Akershus, 1971) and of the increasingly densified Skårer in 2022 (© Lørenskog kommune, 2022)

view from the open plains to the surrounding landscape characterized by forest-covered hills, one experiences the new buildings disrupt this spatial connection. The feeling of the centre becomes introverted; instead of offering an open view over green plains and hills, the built environment obstructs it. The inhabitants raised concerns about these spatial changes (which can be experienced as a loss of identity, history, and green spaces), resulting in a call to slow down building activity within the municipality.[36] The municipal plan from 2023, which builds on previous plans, explains these morphological changes.[37] The municipal planning documents reveal that politicians and planners have been pursuing regional and national compact-city strategies. Furthermore, the municipal plan includes areas identified as suitable for intensive development. This spatial concept for development defines clear borders between building zones and heritage zones. I will explore the implications of this distinction further by examining the local Cultural Heritage Management Plan.

MANAGEMENT OF CULTURAL HERITAGE IN LØRENSKOG

Lørenskog's current Cultural Heritage Management Plan, from 2021, is part of the overall municipal plan.[38] The heritage plan consists of three sections. The first part is the main document: *Kulturminneplan del 1: Plandel*, while part two, *Kulturminneplan del 2: Delområder med kulturminner*, provides an overview of areas identified as valuable within cultural heritage zones and considered for inclusion in municipal planning. The third part consists of attachments. Riksantikvaren (the Norwegian Directorate for Cultural Heritage) and the county of Akershus (Akershus fylkeskommune, the regional level of government) supported and provided guidance in the development of the plan.

A cultural heritage management plan can function in different ways. In Lørenskog, it is used as a guide, mostly a thematic plan found in the societal section of the municipal plan (*Kommuneplanens samfunnsdel*). A thematic plan is strategic but not juridical in the same way as the zoning plan in the area section (*Kommuneplanens arealdel*). Some cultural heritage environments are included in the municipal zoning plans. But whilst these zones are formally protected, most of them are located outside the city centre (as shown in fig. 2). The Cultural Heritage Management Plan aims to preserve a representative selection of cultural heritage, including monuments, environments, and landscapes that reflect the local identity and the diversity of Lørenskog's cultural and societal history. The plan also focuses on mapping newer her-

itage, given the rapid development affecting post-war and industrial heritage, particularly around the AHUS hospital and sports-related structures. According to the municipal plan, Lørenskog has fewer heritage objects than most municipalities in the Akershus region, indicating that it is not considered a heritage-rich municipality.[39] The phrase 'fewer cultural monuments' ('færre kulturminner') is used in the plan, seemingly revealing an emphasis on quantifiable material objects and zones in the making of the local heritage management plan. The plan is mainly based on the SEFRAK registry, which lists buildings constructed before 1900 (or before 1945 in the northern region of Finnmark). Furthermore, the national and regional heritage management listings emphasize archaeology and built structures, primarily church-related. The local, regional, and national levels of heritage management also put an emphasis on material heritage that comply with traditional heritage categories (such as those found in archaeology and building preservation).

Fig. 2. Lørenskog's thematic cultural heritage map ('Temakart: Kulturminner i Lørenskog') shows how the heritage zones are situated outside the centre of the municipality. The map was downloaded on 5 July 2023 from www.kommunekart.com/klient/lorenskog/kultur
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As shown in the thematic cultural heritage map (fig. 2), Lørenskog's Cultural Heritage Management Plan emphasizes rural heritage and landscape elements surrounding the municipality. Only a few zones are identified within the new city centre of Skårer. The map also clearly contrasts the urban fabric with the surrounding green forests. It highlights rural heritage areas that are less likely to face conflicting interests, such as forested areas used for recreation and historical farms still surrounded by nature. The findings reveal a lack of a comprehensive understanding of the urban environment as a cultural landscape, as advocated in the HUL approach introduced earlier in this article.

During the recent revision of the municipal plan, inhabitants were invited to go on a treasure hunt in the centre of the municipality (fig. 3). QR codes were placed out where one could scan to learn more about Lørenskog's history. The place names found on the map are primarily associated with former historical farms ('gård'), plains ('sletta'), and farmyards ('tun'). The last is a word with a richer meaning, which comes from old Norse and signifies

Fig. 3. Treasure hunt in the centre of Lørenskog—find the stories where they emerged ('Skattejakt i Lørenskog sentrum—finn historiene der de oppsto'). © Lørenskog kommune/Norconsult/Baezeni.

an enclosed shared space often associated with the origin of towns. On the treasure map, it is interesting to note the dichotomy between the use of wording, 'Fortidas Lørenskog' or Lørenskog of the past (red dots in fig. 3), whilst 'Framtidas Lørenskog' means Lørenskog of the future (yellow dots in fig. 3). The choice of phrases signalizes a clear distancing from the heritage of the past, now treated as immaterial stories rather than being fully acknowledged as part of the contemporary cultural landscape.

The Cultural Heritage Management Plan shows examples of a categorical understanding of heritage that focuses on representativity. The societal part of the new municipal plan mentions the importance of cultural heritage for a sense of belonging and community, but the wording, 'knowledge of the municipality's cultural heritage and historical development can give residents pride and interest in local history', exemplifies a limited understanding of heritage as immaterial history rather than acknowledging it more fully as a spatial and material experience that can have a broader impact on other fields of planning.[40] The heritage plan's intention to integrate heritage concerns across sectors has yet to be fully realized across the different sections of the municipal plan.

When Lørenskog advocated for a new municipal plan in the fall of 2022, the intense transformation and densification of the municipality were downplayed, whilst the green areas surrounding the urban core were emphasized instead.[41] In the rural farming origins of the place, nature was integral, but is now increasingly zoned in. Similarly, cultural heritage is contained within some regions of the new municipal plan, but primarily outside the city centre. At the same time, the heritage in the centre is reduced from material experiences to immaterial history (with the treasure map in fig. 3 as one example). The planning and heritage management practices seemingly contribute to the prolongation of a traditionally modernistic understanding that separates city and nature, the built and the unbuilt, and simultaneously heritage and modern development.

HERITAGE AND PLACE QUALITY IN THE PLANNING OF LØRENSKOG

In the aerial photo (fig. 4), one can see the results of the transformation of the rural plains of Skårersletta in the increasingly urbanized centre of Skårer. In the planning and heritage management documents, the cultural landscape is depicted as part of the protected natural environment outside, while heritage

in the centre is limited to designated zones. It is evident from experiencing the results of development that the protected heritage sites and the newer urban areas lack a spatial connection to one another.

When considering place qualities, it is important to be open to possible differences in spatial preferences. For instance, I noted that the Triaden shopping centre is not recognized in the Cultural Heritage Management Plan, although it has been highlighted as a valued place for the children living in the municipality.[42] The importance of the shopping centre as a meeting place for local residents does not necessarily align with the traditional notions of what is valuable heritage. It can nonetheless signal a preference among some inhabitants regarding the qualities of the places they prefer. An interpretation of a boulevard, a spatial feature commonly found in historical city centres, has been implemented in the new centre of Skårer. The new boulevard connects the two shopping centres at its two ends, Triaden and Metro. More and more retail functions have been implemented on the boulevard, resulting in increasing privatization of the area. Knowledge from social practices connected to land cultivation for hundreds of years is lost in contemporary development, thus influencing the continuity of culture and the possible uses of the place. Instead of continuing the prior use of the landscape to

Fig. 4. The Skårer area—the diagonal shopping centre, Triaden (left), and the historic farm, Skårer gård (right), with the newly established boulevard in between © 2019 Kartverket, NIBIO, and Statens vegvesen.

seed, grow, and harvest, it has primarily been changed into areas for living and consumption. At the same time, the densification, scale, and form of the buildings influence the experience and use of the environment. On one side, retail spaces face the boulevard. On the other, private garden spaces are reserved for the residents of apartment building complexes. The increasingly private nature of the area seems to limit the use possibilities of the urban spaces and landscape and stand in the way of creating the urban qualities the plan strives for. Today, it is possible to find very few non-designed, unprogrammed, and uncontrolled spaces that might allow for more spontaneous use and could have allowed the place's sociocultural richness to unfold. The development appears to result from a generic interpretation of the national and regional plans, prioritizing common urban attributes at the expense of more context-specific, locally grounded ones.

Zooming further into the photo (fig. 4), the historical farm Skårer gård and the newly refurbished Triaden shopping centre represent rural heritage and new development on the two sides of the boulevard. The green (unbuilt) and grey (built) areas contrast starkly and exemplify the siloed thinking that Sieverts previously mentioned, which includes the critique that our planning and development systems are based on modern planning principles that are still producing dichotomies between nature and the built environment. This is further emphasized by the fact that the farm has been turned into a museum.[43] It further demonstrates that Lørenskog's heritage and development are presented as opposing ideas that manifest and become clear spatially. The built and natural heritage inherited from the past is not presented as an integrated part of visions of the future. The treasure hunt (fig. 3), used here as an example, demonstrates and further entrenches this dichotomy. Heritage, such as Skårer gård, can hence be experienced as being out-of-place in this in-between city's present and future form.

Rethinking the Place Qualities of In-Between Cities

As outlined in the methodology section of this article, Lørenskog has been identified as a paradigmatic case, providing a basis for discussions on current planning practices. The results from the case study demonstrate the relevance of Lørenskog as an example of contemporary planning and the management and development of cultural heritage. In this section, the article examines and interprets the findings within a broader theoretical framework, drawing on concepts such as in-between cities, varied interpretations of qualities, and critical heritage theory.

Assessing the Management of Cultural Heritage in Lørenskog

A critical document analysis of Lørenskog's Cultural Heritage Management Plan was conducted to evaluate how heritage knowledge is systematized and applied. In a rapidly developing landscape like Lørenskog, identifying local heritage values on a larger scale remains challenging due to the municipality's object-centric approach to heritage management.[44] The emphasis on regional and national heritage values results in a limited inclusion of locally informed cultural perspectives. The Cultural Heritage Management Plan adopts representativity as one of the primary criteria for selection, relying heavily on existing registries and expert-led mapping processes.[45] While the plan focuses on managing a representative collection of cultural heritage objects, it pays less attention to broader areas or cultural environments ('kulturmiljø'), a zoning category supported by the Norwegian Planning and Building Act. The preserved areas are predominantly in the municipality's rural and sparsely populated regions. This approach raises critical questions about representativity, aligning with critiques by scholars like Laurajane Smith, who has challenged traditional heritage practices for drawing representation from patriotic narratives rooted in American and European identities.[46] Smith further advocates for including heritage users in the defining and valuing of heritage. Viewed and assessed through Smith's lens, Lørenskog's heritage plan reveals a predominantly top-down, expert-driven process, with limited public participation in selecting and prioritizing heritage assets.[47] The approach creates an impression of underrepresentation of the municipality's diverse population. From a bottom-up perspective, a broader heritage mapping could uncover alternative forms of heritage and priorities that better reflect the community's diversity.

The municipal plan's focus on symbolic heritage underscores a lack of local and situational knowledge. A potential way forward involves reimagining how cultural heritage can become more integrated across the municipality's various planning domains, including more qualitative cultural strategies and quantitative and functional sectoral plans such as economic and zoning plans. Embracing innovative approaches to heritage mapping and management could foster a more situated understanding of place qualities based on citizens' perspectives. This, in turn, could support a more dynamic integration of heritage into planning and local development.

The Problem with a Normative Definition of Place Quality

Lørenskog municipality's perspective plan (*Perspektivmeldingen*) and economy plan (*Økonomiplanen*) give a specific direction and prioritization within the municipal planning.[48] Though the municipal plan contains ambitions concerning living quality ('bokvalitet'), none of them are explicitly associated with place quality. In studying the municipal plan, I have noted a lack of emphasis on qualities other than living quality. I find this problematic because the concept of living quality primarily concerns the functional and use aspects of buildings rather than their relationship to the surrounding built and natural environment. It is therefore essential to further discuss the different quality perspectives at play in the planning and development of Lørenskog.

In a meeting with local developers and the municipality of Lørenskog, urban planning professor Elin Børrud presented different ways of relating to qualities of the built environment.[49] Børrud explained the morphological differences and associated attributes in various situations by mapping rural, suburban, semi-urban, and urban situations. In her presentation, she differentiated between the housing qualities ('boligkvalitet') of the individual housing districts, living qualities ('bokvalitet'), and area qualities ('områdekvalitet'). In her presentation, she argues for a situational understanding, which currently seems to be lacking in the densification processes taking place in Lørenskog. To further understand which quality perspectives are emphasized and why, I find it necessary to examine what principles guide local planning from a regional and national perspective.

The municipal plan for Lørenskog permitted urban expansion until the 1980s, but shifted its focus towards replanning existing built areas in the mid-1990s.[50] Since 2015, planning has adhered to national and regionally advocated compact city principles, prioritizing density near mobility hubs.[51] Within this framework, achieving urban qualities has become a central goal. The findings in this article reveal a tension between value-driven priorities and the normative or quantitative ideals often associated with compact city development. To further study this tension, I would like to assess the urban quality dimensions outlined in the quality circle ('kvalitetssirkelen'), a strategic guide intended for use in densification and transformation processes in the Oslo and Akershus regions (fig. 5).

The quality circle emphasizes efficient land use, multifunctionality, and flexibility alongside considerations of local identity, including historical and nature-based elements. However, when assessed from a heritage perspective, the quality circle is problematic for several reasons. Firstly, it diminishes heritage to single objects ('kulturminner'). In the quality circle, cultural heritage is put into a category with nature and local identity, but left out of the social community and quality discussions regarding the built environment ('byggkvalitet og karakter') and flexible use ('flerfunksjonalitet'). Secondly, the quality circle principles can be understood as advocating for recreating qualities traditionally associated with historic urban environments. This leaves little room for a situational perspective regarding place qualities within contexts such as in-between cities. Such an approach to describing qualities with a lack of integration of heritage aspects is problematic, especially within environments such as Lørenskog, where the local characteristics are, to a large degree, rural and become more apparent through a deeper and broader understanding of the cultural landscape. Inclusion of the broader concept of cultural environment ('kulturmiljø') could have provided an opportunity to address the topic more comprehensively and make it align better with current national heritage strategies.[52]

By incorporating the quality circle into this discussion, it becomes clear that while tools like this operationalize some aspects of place quality, they also reveal shortcomings when critically assessed. Like Florida's concept of place quality—centred on creating attractive environments to foster economic growth—the quality circle largely overlooks the intricate connections to heritage and nature. Both focus on urban qualities that emphasize market-driven attributes, such as vibrant city centres and cultural offerings, but largely overlook heritage and landscape perspectives. Specifically, a heavy emphasis on urban qualities may sideline heritage and nature concerns in certain situations, highlighting the need to expand place quality frameworks to include more diverse and context-sensitive perspectives.

Sieverts underscores that the issues in the periphery derive from a categorical understanding that separates the city from its landscape.[53] The case study reveals how planning practice can create and sustain a divided and dichotomous relationship between preservation and development (as well as between nature and culture). Sievert's in-between city concept allows Lørenskog to exist and develop on its own terms rather than being based on ideals connected to historic cities such as Oslo. Places like Lørenskog include a vari-

ety of typologies, including industrial areas, farmlands, suburban housing areas, and green spaces. They are neither towns nor cities but something else. Sieverts points out that modernist planning theory and practice have established a relationship of siloing and separating different types of territories in urban development and planning practice. He furthermore points out that land use can be unpredictable in such places, as it is influenced by market forces and ad-hoc urban development decisions rather than comprehensive planning. His concept highlights the need for flexible and adaptable planning strategies to accommodate the dynamic nature of in-between city areas, where urban and rural features can coexist simultaneously.

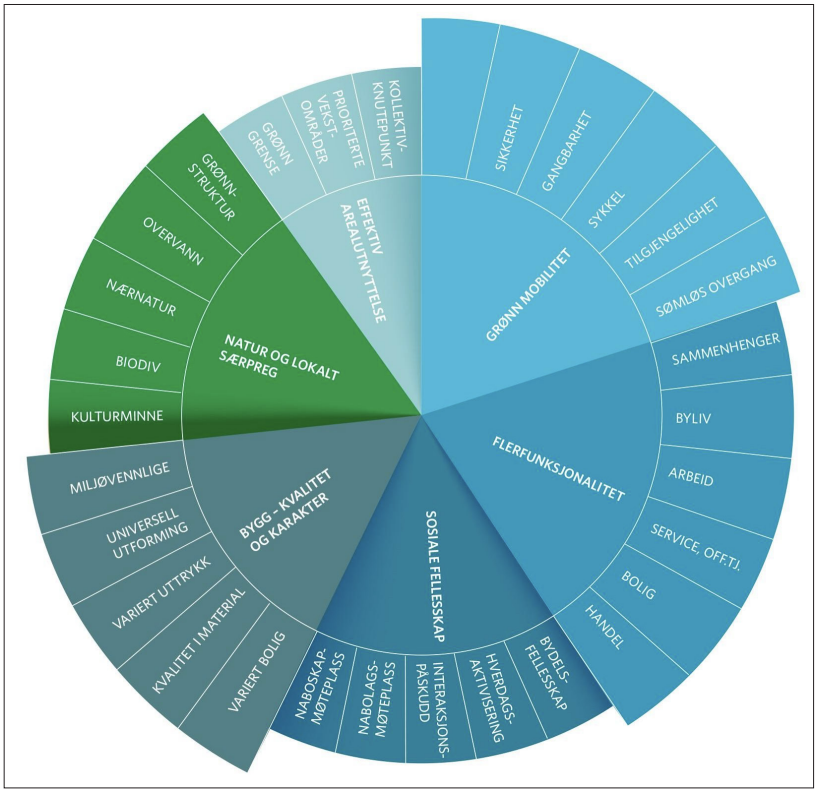

Fig. 5. The quality circle ('kvalitetssirkelen') as presented in ***Fortetting og transformasjon med bykvalitet i bybåndet*** *(Kristiansen et al. 2019) © OsloMet*

My research into Lørenskog finds that heritage is reduced to something manageable and sectoral rather than being an integrated aspect of planning. I have showcased how Lørenskog's Cultural Heritage Management Plan is heavily based on expert knowledge, thus emphasizing regional and national concerns. It focuses on representational heritage objects and zones derived from principles and tools based on the current planning systems. This is problematic since it builds up under an opposition between heritage and development, as the case exemplifies. As shown by an examination of the current national, regional, and local planning tools and their use in Norwegian planning and development, it is important to differentiate between urban and place qualities and broaden both in relation to cultural heritage.

As Sieverts explained and Lørenskog exemplifies, some places exist between rural and urban areas. The few cultural monuments listed in the heritage management plan showcase that in these types of in-between places, there is less historical urban fabric to manage than within a more traditional historical urban centre. This highlights a further need to rethink how heritage is mapped and managed through development in such situations. The quality circle (fig. 5) contributes to the problem through its lack of an integrated understanding of heritage. Further integration of heritage could be achieved by adopting a more relational approach within the urban context that allows for incorporating heritage more broadly and inclusively. One possible way forward is to adopt a landscape approach in mapping, managing, and developing these places. Such an approach emphasizes fostering a balanced and integrated relationship between built and unbuilt environments and the cultures that shape and interact with them.

The case study findings suggest, supported by Sieverts, that in managing heritage on a local and regional level, a different approach is needed to manage those inherited qualities in nature and culture or to reconnect with them. Sieverts emphasizes the importance of planning in-between places at both local and regional scales rather than relying solely on regional approaches.[54] The case study findings also support this view, highlighting the need to manage inherited natural and cultural qualities on different scales, both strategically and contextually. The findings thus call for a simultaneous focus on local and regional scales in planning. At the same time, national and regional policies should adopt flexible, adaptive strategies that reflect specific local conditions rather than imposing normative frameworks.

Mapping and Managing Heritage in the Development of Place Qualities

At the beginning of this article, the following questions were raised: How can challenges in the heritage management of in-between cities be understood using Lørenskog as a case study? How can these perspectives enrich our knowledge of place qualities in the planning and development of in-between cities? The first question helped identify challenges, laying the foundation for the second question, which allowed for the exploration of potential solutions. Through these questions, this article has explored how heritage is mapped and managed in the development of place qualities in the Lørenskog municipality, whilst the in-between city concept opened for exploring this case independent of persisting categories of urban or rural. Lørenskog was identified as a paradigmatic case, suggesting that insights gained from this study might apply to other places in the peripheries of bigger cities. This article thus challenges the limited interpretation of place qualities often derived from the context of larger urban centres by examining the case through an interdisciplinary lens combining cultural heritage and planning perspectives. The results of the study highlight how applying a normative understanding of place qualities outside historical urban centres can inadvertently affect heritage and place qualities. The critical assessment of Lørenskog's Cultural Heritage Management Plan and the local municipal plan revealed a lack of local citizens' perspectives regarding heritage and place qualities. The municipal plan instead incorporates preconceived notions of living qualities and a limited representative understanding of heritage defined by local and regional levels. The cultural heritage management plan exists as a static document that emphasizes listing material heritage whilst continuously overlooking the inhabitants' experiences. Understanding how citizens perceive their local heritage is therefore essential for enriching the concept of place qualities further so that it can serve in-between places such as Lørenskog.

When the case study and critical analysis of the heritage management plan are evaluated together, it becomes clear that many heritage aspects are overlooked. Assessed through the HUL approach, the heritage management plan consists of static representations rather than recognizing Lørenskog as a dynamic cultural landscape. Cultural mapping methods, such as interviews, could unravel a richer diversity in the municipality's material and immaterial heritage. At the same time, there is potential for rethinking the plan as a dynamic tool for mapping and managing heritage. Participatory approaches can help define heritage that better reflects the diversity of the citizens and

could provide a broader understanding of the community's cultural landscape, which could then have a more significant effect on the municipality's planning.

The findings highlight an issue with sectoral segmentation of heritage, where heritage management is often isolated from other fields. This detachment also stands in the way of integrating heritage within broader planning frameworks. For planning and development to respond better to local contexts, I consequently suggest rethinking the notion of place quality to include a richer heritage perspective. This requires moving beyond a material focus and towards recognizing urban heritage as part of cultural landscapes. Adopting this broader notion across policy, governance, planning, and development fields requires a shift to inter- and transdisciplinary thinking. At the same time, cross-sectoral engagement is needed to overcome the object- and zoning-centred principles commonly practiced in heritage management and planning. The expanded notion of place qualities invites collaboration among diverse sectors and stakeholders, enabling further integration of heritage perspectives in planning and development. Implementing the rethought concept may therefore result in spatial concepts and experiences that enhance the unique qualities of all landscapes, including in-between cities.

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NOTES

[1] Mel Burton, 'Quality of Place', in *Encyclopedia of Quality of Life and Well-Being Research*, ed. Alex C. Michalos (Dordrecht: Springer Netherlands, 2014), pp. 5312–14; Perann Sylvia Stokke and Lisa Larstuvold (eds.), 'Attraktiv by—Statens pris for bærekraftig by—og stedsutvikling. Forbilder fra 2015–2022' (NAL, Oslo, 2022).

[2] Lørenskog kommune, 'Medvirkningsrapport—Høring Planforslag' (Report, Lørenskog kommune, 2023), p. 5.

[3] Mel Burton, 'Quality of Place'.

[4] Richard Florida, *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life* (New York: Basic Books, 2002), pp. 231–34.

[5] Matthew Carmona, *Public Places Urban Spaces: The Dimensions of Urban Design*, 3rd edition (New York and London: Routledge, 2021), pp. 580–86.

[6] Carmona, *Public Places Urban Spaces*, p. 584.

[7] Many scholars have contributed to describing the heterogenous nature of peripheral urban contexts in Martina Barcelloni Corte and Paola Viganò (eds.), *The Horizontal Metropolis: The Anthology* (Cham: Springer Nature, 2022).

[8] European Ministries of Culture, 'Davos Declaration 2018' (policy document, Swiss Confederation, Davos, 2018).

[9] The interconnected psychological, social, and environmental processes concerning physical spaces have been theorized by a range of disciplines such as social and health geography, see e.g. John Eyles and Allison Williams (eds.), *Sense of Place, Health and Quality of Life* (London: Ashgate's Geographies of Health Series, 2016).

[10] Williams, *Sense of Place, Health and Quality of Life*.

[11] Paola Viganò, 'Genealogy, Tradition: An Anthology', in Corte and Viganò, *The Horizontal Metropolis: The Anthology*, pp. 1–7.

[12] Thomas Sieverts, *Cities without Cities: An Interpretation of the Zwischenstadt* (London: Spon Press, 2003).

[13] Corte and Viganò, *The Horizontal Metropolis*, pp. 499–509, 527–37.

[14] Jukka Jokilehto, *A History of Architectural Conservation* (Oxford: Butterworth-Heinemann, 1999).

[15] Vitor Manuel Araújo de Oliveira, *Urban Morphology: An Introduction to the Study of the Physical Form of Cities* (Porto: Springer, 2016), pp. 141–97.

[16] Riksantikvaren, 'Urban Heritage Analysis: A Handbook about DIVE' (report and method, Oslo, 2010).

[17] Kevin Lynch, *The Image of the City* (Cambridge: The MIT Press, 1960).

[18] Ken Taylor, 'Cities as Cultural Landscapes', in *Reconnecting the City: The Historic Urban Landscape Approach and the Future of Urban Heritage*, ed. Francesco Bandarin and Ron van Oers (Chichester: Wiley Blackwell, 2015), pp. 179–202.

[19] Taylor, 'Cities as Cultural Landscapes', pp. 179–81.

[20] Taylor, 'Cities as Cultural Landscapes', pp. 179–83.

[21] Francesco Bandarin and Ron van Oers (eds.), *Reconnecting the City: The Historic Urban Landscape Approach and the Future of Urban Heritage* (Chichester: Wiley Blackwell, 2015), pp. 1–16.

[22] Elin Børrud, 'Byutvikling, bolig og bokvalitet—Om byplanlegging i transformasjonsområder' (lecture, Lørenskog hus, Lørenskog, 25 October 2022); Astri Margareta Dalseide, Gro Sandkjær Hansen, Joar Skrede, Helle Dyrendahl Staven, and Svenn-Erik Mamelund, 'Erfaringer med å sikre arkitektonisk kvalitet gjennom planlegging' (official Norwegian report—AFIs FoU-resultat 2020:04, Oslo, Arbeidsforskningsinstituttet Oslo Met—Oslo Metropolitan University, 2020); Are Kristiansen, Liv Kaasen, Silje Sørlie Hammershaug, Jan Willy Føreland, Gro Sandkjær Hanssen, and Berit Irene Nordahl, 'Fortetting og transformasjon med bykvalitet i bybåndet—Oppfølging av regional plan for areal og transport i Oslo og Akershus' (regional policy document, Oslo and Akershus: WSP and NIBR OsloMet, 2019); Oslo Economics, Holth & Winge AS, and A-lab, 'Arkitektonisk kvalitet i plan- og byggesak—Utarbeidet for Kommunal- Og Distriksdepartementet' (official Norwegian report—OE-Rapport 2023–10, Oslo, February 2023).

[23] Richard Florida, *The Rise of the Creative Class—Revisited: Revised and Expanded* (New York: Basic Books, 2012), pp. 280–303.

[24] Mel Burton, 'Quality of Place', p. 5313.

[25] Karl Otto Ellefsen and Halvor Weider Ellefsen, 'Med altoverskyggende mål om bymessighet', *Nytt Norsk Tidsskrift*, 37/3 (2020), pp. 200–12; Kristiansen et al., 'Fortetting Og Transformasjon Med Bykvalitet i Bybåndet'.

[26] Riksantikvaren, 'Riksantikvarens strategi og faglige anbefalinger for by- og stedsutvikling' (policy document, Riksantikvaren, Oslo, 2021), p. 49.

[27] Robert K. Yin, *Case Study Research: Design and Methods*, 4th edn. (California: Sage Publications, 2009), pp. 2–5.

[28] Bent Flyvbjerg, 'Five Misunderstandings About Case-Study Research', *Qualitative Inquiry*, 12/2 (2006), pp. 219–45, https://doi.org/10.1177/1077800405284363 [all URLs here accessed in January 2025].

[29] Kennet Lynggaard, 'Dokumentanalyse', in *Kvalitative Metoder*, ed. Svend Brinkmann and Lene Tanggaard (Copenhagen, 2020), pp. 185–202.

[30] Lynggaard, 'Dokumentanalyse'.

[31] Lørenskog kommune, 'Kulturminneplan—Del 1 (Plandel)' (Cultural Heritage Management Plan, Lørenskog municipality, 2021); Lørenskog kommune, 'Kulturminneplan—Del 2 (Delområder med kulturminner)' (Cultural Heritage Management Plan, Lørenskog municipality, 2021); Lørenskog kommune, 'Kulturminneplan—Del 3—Vedlegg' (Cultural Heritage Management Plan, Lørenskog municipality, 2021).

[32] Dalseide et al., 'Erfaringer med å sikre arkitektonisk kvalitet gjennom planlegging', pp. 12–14.

[33] Statistics Norway, 'Table 09817', 9 March 2023.

[34] Lørenskog kommune, 'Medvirkningsrapport—Høring Planforslag', p. 5.

[35] Benedicte Johannessen Abrahamsen, 'Fra demografi til byform i Lørenskog: arealplanlegging som teknisk støtte for beslutningstakere i et regionalt pressområde' (Master thesis, Norwegian University of Life Sciences, Ås, 2020), pp. 78–79.

[36] Lørenskog kommune, 'Medvirkningsrapport—Høring Planforslag'.

[37] Lørenskog kommune, 'Kommuneplanens Arealdel 2023–2035. Planbeskrivelse' (planning document, Lørenskog municipality, 2023).

[38] Lørenskog kommune, 'Kulturminneplan—Del 1 (Plandel)'. Lørenskog kommune, 'Kulturminneplan—Del 2 (Delområder med kulturminner)'; Lørenskog kommune, 'Kulturminneplan—Del 3—Vedlegg'.

[39] Lørenskog kommune, 'Kommuneplanens Arealdel 2023–2035. Planbeskrivelse', p. 18.

[40] Lørenskog kommune, 'The Social Element of the Municipal Plan' (planning document, Lørenskog municipality, 2020), p. 20.

[41] Arna Guðbrandsdóttir, 'Informasjon om hovedpunkter i forslag til ny arealdel' (presentation, Lørenskog kommune, Lørenskog hus, 18 October 2022).

[42] Yokoland, *Lørenskog Hus* (Lørenskog: Lørenskog kommune, 2011).

[43] 'Om oss—Lørenskog bygdemuseum', Lørenskog bygdemuseum, 21 August 2023, https://mia.no/lorenskog/om-oss.

[44] Lørenskog kommune, 'Kulturminneplan—Del 1 (Plandel)'; Lørenskog kommune, 'Kulturminneplan—Del 2 (Delområder med kulturminner)'; Lørenskog kommune, 'Kulturminneplan—Del 3—Vedlegg'.

[45] Lørenskog kommune, 'Kulturminneplan—Del 1 (Plandel)', pp. 42–44.

[46] Laurajane Smith, *Uses of Heritage* (Routledge, 2006), pp. 17, 23, and 49.

[47] Lørenskog kommune, 'Kulturminneplan—Del 1 (Plandel)', pp. 42–44.

[48] Ragnar Christoffersen, 'Kommunedirektørens Styringsbrev' (management letter, Lørenskog kommune, 2023).

[49] Børrud, 'Byutvikling, Bolig og Bokvalitet'.

[50] Abrahamsen, 'Fra demografi til byform i Lørenskog', pp. 50–51.

[51] Akershus fylkeskommune and Oslo kommune, 'Regional plan for areal- og transport i Oslo og Akershus' (regional planning strategy, Akershus fylkeskommune and Oslo kommune, 2015).

[52] Such holistic thinking was recently incorporated into the Norwegian Directorate for Cultural Heritage's *Strategy and Policy for Urban Heritage* in 2021. Riksantikvaren, *'Riksantikvarens strategi og faglige anbefalinger for by- og stedsutvikling'*, p. 49.

[53] Corte and Viganò, *The Horizontal Metropolis*, p. 529.

[54] Corte and Viganó, *The Horizontal Metropolis*, p. 530.

ARCHITECTURAL QUALITIES OF CIRCULAR NEIGHBOURHOODS: A REVIEW OF SUSTAINABILITY RATING SYSTEMS

Béatrice Stolz

ABSTRACT

Although changes in the built environment are closely related to societal dynamics, such as population ageing, immigration, and shifts in local trends, solutions to address circularity in cities are mostly techno-centred. They deal with energy recovery, waste management, or efficient use of water. Whilst technical tools provide essential solutions to circular environments, a context- and value-based approach would unlock circular potentials already present in a place. Research gaps show that a holistic approach involving transdisciplinary processes is needed.

This research discusses how circularity in the built environment is evaluated today and whether a holistic understanding of architectural qualities in neighbourhoods may be beneficial. The aim is to challenge common understandings around circularity, which continue to be addressed mainly through technical solutions and digital tools, by opening them up to other fields of knowledge. Architecture is situated between the hard and the social sciences, thus acting as a mediator between disciplines. An analysis of different sustainability rating systems used in Norway facilitates discussion of how circularity is understood today. Rating systems are widely used and inform decisions with respect to several life stages of buildings. This makes studying them relevant to study. Whilst focusing mainly on technical solutions, such systems can also lean towards questions of social sustainability, identity, or behaviours. The requirements they propose help us to understand which architectural qualities are considered and how they facilitate the application of circularity to the urban realm. Overlaps between requirements show that values generated by architectural qualities affect each other across scales. The final section of the article addresses the connection between architectural qualities and values, hence supporting transdisciplinary processes.

KEYWORDS

architectural qualities, transdisciplinarity, neighbourhood scale, circularity

INTRODUCTION

Circular Economy (CE) strategies are growing worldwide as minimizing waste and maximizing resource efficiency is one of the responses to sustainable development. CE can be described as an economic system that replaces the waste from a product's 'end-of-life' by reducing, reusing, recycling, or recovering its materials in production, distribution, and consumption processes.[1] Following this definition, circular developments in cities aim to create ecologically regenerative and resilient environments for a transition towards a more sustainable future.[2] The economist Kate Raworth expands this definition to include the necessity of social considerations to support circularity.[3] With her concept of Doughnut Economics, she draws on CE principles and the planetary boundaries framework developed by Steffen et al.[4] These boundaries represent an ecological limit that human beings should not exceed to respect the natural environment. To this outer limit, Raworth adds an inner limit representing a threshold for fundamental human rights, which no people should fall below. A social foundation can thus support the management of the earth's resources whilst remaining below the ecological ceiling.[5] This shares the idea that society and robust social values are key to supporting circular and regenerative systems. A first step before *closing the loop* of resources would thus be to reduce or *slow down the loop* of resources by acknowledging what already exists through acts of care, repair, and maintenance, and by rethinking our consumption habits.

However, research presents a gap around circularity in the built environment. How circularity principles are implemented today is mostly techno-centred, with the aim of driving innovations and technical changes to optimize resource flows.[6] A review of research publications on circular cities between 2010 and 2020 shows that the research considers mainly waste management and construction techniques and has a limited focus on the inclusion of social considerations.[7] When applied to the built environment, sustainability rating systems can guide the implementation of circular principles. Wiik et al. mention over 600 rating systems used globally.[8] Among them, The Norwegian Buildings Regulations (TEK), the European Taxonomy (EU Taxonomy), FutureBuilt, BREEAM-NOR v.6, Powerhouse Paris Proof, the Research Centre for Zero Emission Buildings (FME ZEB), and the Research Centre for Zero Emission Neighbourhoods in Smart Cities (FME ZEN) are widely used in Norway. However, only BREEAM-NOR,[9] FutureBuilt,[10] and the EU Taxonomy,[11] address challenges of circularity.[12] Additionally, BREEAM has developed a version of its rating system, BREEAM Communities,[13] available

in Norway. It gives insights into potential circular aspects of neighbourhoods. BREEAM-NOR, BREEAM Communities, FutureBuilt, and the EU Taxonomy therefore provide a range of evaluation criteria that will inform the circularity and sustainability of new projects. They are constantly being revised to adapt to new environmental objectives and trends in the building sector,[14] and provide guidelines for calculating the buildings and materials' footprint and impact on nature and promote circular design principles by informing architects and the design teams on circular choices.

But how to ensure that these solutions do not transgress the social foundation expressed by Kate Raworth? Inversely, can the social foundation support how cities are designed and developed? Can the discipline of architecture think beyond buildings and physical structures to support circularity? A holistic approach could ensure that technical solutions and social considerations drive circularity together.[15] This would then fill the gap around circularity by considering a set of qualities present in a site and how they affect social values around the site. Transcending the building scale and including the neighbourhood scale is therefore necessary to integrate the broader urban system. A set of qualities brought together in one place will give it a specific character with emerging values. At a building or neighbourhood scale, a quality is described as the result of a set of objective characteristics and their effects on inhabitants.[16] For example, a certain aesthetic of the facades will give an identity character to a neighbourhood, generating sociocultural values for the residents; or the inclusion of green areas and parks in the street pattern of a neighbourhood will enhance an area's sense of safety and social aspects.

Considering the abovementioned gap, this research investigates whether a holistic understanding of architectural qualities in neighbourhoods may be beneficial. The aim is to challenge common understandings around circularity and to promote context- and value-based circular practices. This article therefore reviews existing criteria for evaluating circularity in neighbourhoods to propose a structure for a new framework for assessing the gaps holistically. This will enrich the dimensions, also beyond technological solutions, usually considered when implementing circularity. It expands the definition of circularity by linking it to a set of architectural qualities, thus providing more evident guidelines for practitioners. The research question is: How can a holistic consideration of architectural qualities in neighbourhoods support circularity?

First, a theoretical background provides information on different circular perspectives and their application to the built environment. It shows that current solutions for responding to circular challenges rely mainly on technological improvements, but that an understanding of the context is nonetheless needed. Additionally, architectural qualities are explored at the scale of both buildings and neighbourhoods, providing guidelines for how practitioners from different fields as well as actors of the built environment might impact qualities to solve circular challenges. This is followed by a description of sustainability rating systems examining how circularity is evaluated based on different rating systems commonly available in Norway: BREEAM-NOR, BREEAM Communities, FutureBuilt, and the EU Taxonomy. A method that enables the three concepts of circularity, architectural qualities, and sustainability rating systems to be brought together is then presented. These concepts are the basis for arguing that a context-based approach to architectural qualities may strengthen transdisciplinary processes and support circular practices. The results show that the sustainability rating systems all address circularity from a different perspective, and that combining them could result in a more holistic approach to circularity. The primary sources used for this study are scientific readings and analyses of official documents from sustainability rating systems.

THEORETICAL BACKGROUND

Circularity of the Built Environment from Different Perspectives

Circular Economy thinking originates from Ecological and Environmental Economics and Industrial Ecology.[17] It is applied to the built environment through understanding its Urban Metabolism (UM), which is seen as an accounting tool for cities and refers primarily to the energy emitted by specific sectors of industry. Implementing circularity in cities today therefore focusses on closing material loops through cradle-to-cradle thinking, relying on technologies to monitor resource flows, and integrating energy-efficient solutions. Consequently, little attention is given to the contextualization of flows and the circular spatial dimension.[18] However, if circular practices focus on closing loops of materials, there is an opportunity to first slow down the loops of materials.

Slowing down the loop means reducing the consumption of resources and maintaining them for a longer period. This implies understanding consumption behaviours and sociocultural values in a specific area. For instance, a sense of belonging to a specific neighbourhood will result in the inhabitants'

performing acts of care and repair. Accordingly, taking a context-specific and socially inclusive approach to circular systems is important to ensure their sustainability.[19] To address the multi-dimensions of an area, circular cities find it necessary to engage with different fields of knowledge and actors, thus valorising a transdisciplinary approach. Fields such as sustainable engineering and industrial ecology can ensure that flows of materials are localized. Ecological economics promotes a circular economy focussing on local exchanges. Political ecology and urbanism focus on norms and urban planning regulations at different scales (local, regional, and territorial). Geography and landscape design focus on rethinking the boundaries of different flows: of materials, people, resources, or knowledge networks, for instance. Participatory planning, social sciences, and architecture focus on integrating social needs in the development process to arrive at an integrated design approach.[20]

Consequently, the approach should be two-fold: *technocratic*, focussing on making material flows more circular through innovation and quantitative measures; and *emancipatory*, focussing on the context and using qualitative methods to understand the social practices present in an area to enhance their potential for circularity. These two approaches are combined in an analytical framework of circularity drivers created by Marin and De Meulder (fig. 1).[21] The technocratic approach affects the performance and optimization of resources, which the authors define as *designing circularity*, whereas an emancipatory approach is defined as *designing with circularity. Designing circularity* is understood as an application of circular principles to a specific site. *Designing with circularity* explores the potentials and characteristics already present in a site to develop circularity from already available resources. As the framework aims to inform a spatial application of circularity, the authors add another axis: connectivity-proximity: Proximity concerns the geographical location, and everything centred in a specific place. Connectivity involves the interactions between different flows and the connections between different areas.

Between the technocratic and proximity axes, the main aim is *optimizing* flows. This is ensured from the top down by focussing on energy efficiency and clean technology. It may be addressed by fields from the hard sciences, such as structural engineering or industrial ecology. For instance, they use quantitative methods to understand the flows of materials and their related CO2 emissions. Between the technocratic and connectivity axes, the agenda

is *innovation*. Circular Economy business models and digital networks ensure this. Fields such as ecological economics focus on the application of circular economy, and manufacturing focusses on digital tools to automate and track material data. From the emancipatory and proximity axes, *contextualizing* flows facilitates a space-specific circularity approach, with the main aim of restoring ecological cycles in a specific area. Fields like architecture, landscape architecture, and geography focus on working with existing resources on site. What natural resources, are locally available? What resources are embedded in the existing architecture? What are the ecological cycles of the site? The risks? Here, understanding the physical context is a primary step towards circularity. Lastly, from the emancipatory and connectivity axes, the main motive is *democratizing* flows. This favours bottom-up initiatives to support circularity through community stewardship of resource flows. Urban planning and political ecology focus on the sociohistorical context to unlock possible circular practices. As democratizing and contextualizing the

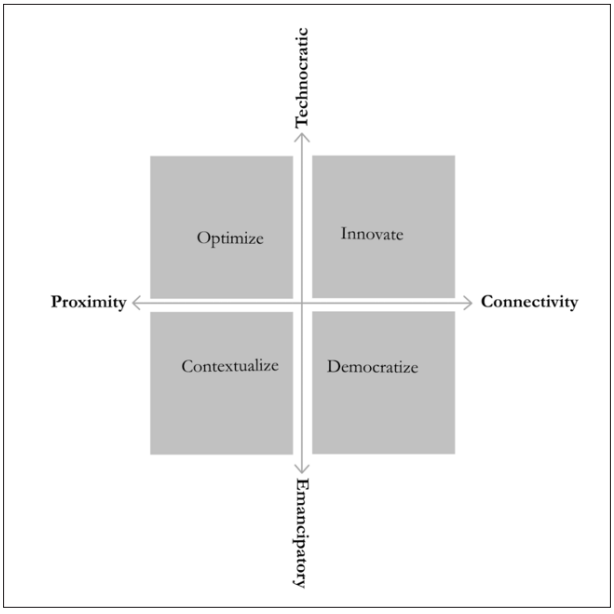

Figure 1. Reproduction of Marin and De Meulder's analytical framework of circularity drivers, 2018. Source: The author

flows are context-based approaches, they also engage with communities in specific areas, hence pointing to the relevance of transdisciplinarity. Whilst a technocratic approach is necessary to develop circular solutions, an emancipatory approach enhances circular potentials already embedded in a place.[22]

The framework developed by Marin and De Meulder looks at the spatial application of circular drivers. It helps understand the main motives of different circularity perspectives, which are held by several disciplines. It brings together concepts of circularity applied to the built environment. It will thus serve as a basis for the further development of this article, as it helps to develop a holistic vision for circularity. Additionally, as the built environment constantly evolves through demolition and rebuilding, such changes can be an opportunity to implement circularity by means of circular constructions or urban developments. Consequently, circularity affects and is affected by different qualities of the built environment. The next section will attempt to clarify the notion of the architectural quality of the built environment, from the building scale to the neighbourhood scale, to understand how they can be conducive to circular developments.

Architectural Qualities across Scales

The concept of quality in architecture has been actively debated for decades. Magnus Rönn defines it as an open concept extending between worldviews.[23] On one side, *positivism* emphasizes functionality and a rationalization of architecture production through technological development. It is often criticized for a lack of consideration of sociohistorical context.[24] From a positivist perspective, quality is evaluated impartially based on physical facts and can thus be controlled by quality standards. On the other hand, *constructivism* relates to the experiences of individuals and incorporates insights from sociology, psychology, history, and philosophy. In constructivist thinking, architectural quality requires individual encounters and experiences.[25] Articulating two worldviews, Rönn describes the concept of quality in architecture as a combination of objective characteristics and subjective experiences.[26] The objective characteristics are universal and quantifiable: the size of a building or its materiality, for instance. Then, from the objective characteristics arises a subjective experience: the smell or colour, the development of a particular identity, which everyone might experience differently. He also mentions the presence of collective traits in people's experiences vis-à-vis architectural quality, which are related to their cultural background and professional practice.[27] In this research, subjective experiences are also referred to as *values*.

Numerous authors have attempted to define and categorize architectural qualities[28, 29, 30] At a building scale, features like the spatial layout, which emerges from the original function of the building, as well as the materials employed for the structural system and the secondary elements (partition walls, facades, and roof, for example) are several objective characteristics that will give it an identity. When set up in a certain way, the objective characteristics will offer different subjective experiences, thus generating different values. For instance, flexibility in the layout of a house will enable the residents to adapt it to their needs, hence generating well-being and a sense of appurtenance. A selection of particular materials for a facade will give it an aesthetic value.

Something similar applies at the neighbourhood level.[31, 32] Contextualizing a building in a neighbourhood, taking into consideration its spatial, environmental, historical, cultural, or political context, would make it possible to understand the traits of different neighbourhoods and their drivers for circularity. This also reveals community practices and supports a context-based and integrated approach to circularity. Metzger and Wiberg bridge the architectural qualities at building and neighbourhood scales.[33] The characteristics observed in buildings are set together, and in combination with the streetscape and some specific characteristic buildings (or landmarks) form a neighbourhood. This combination of buildings, landmarks, and streetscapes brings together different values from different subjective experiences, which the authors call *latent urban qualities*. Gocer et al. define neighbourhoods' qualities as the sets of characteristics and their effects on residents.[34] Some attributes of neighbourhood quality are green and blue structures, which generate social values and well-being; the number of facilities: schools, public activities, shops, which provide economic and social values to a neighbourhood: the street patterns and the connections, generating accessibility, connectivity, mobility, and inclusiveness; the housing quality, mix of housing types, land use, et cetera.

Table 1 provides a summary of the architectural qualities: a combination of objective characteristics and subjective experiences. The objective characteristics are measurable or quantifiable features focussing on the practical and functional aspects of buildings and neighbourhoods. The subjective experiences, or values, are perceptual responses to the built environment. They are diffuse and generated by a combination of several characteristics.

Whether from a positivist or constructivist point of view, understanding architectural quality also implies an evaluation, based on either quality standards, rating systems, or the experiences of individuals. How to know what is good or bad quality in architecture? Going back to the two world-views, the aim is thus to understand how architectural qualities are considered and evaluated in the built environment, and how they can be acted upon to respond to the challenges of circularity.

By reflecting on the framework developed by Marin and De Meulder, as well the above-listed architectural qualities from the building scale to the neighbourhood scale, the following section of this article investigates how the built

	Objective characteristics	Subjective experiences
Building scale	Building elements (doors, windows, walls, roof and so on) Building materials Space plan (layout, space utilization, function, uses) Services (water systems, electricity, security systems, management systems technologies) Skin (facade materiality, openings, access, tightness) Structural system (connection and capacity) Dimensions Site (location, access)	Flexibility and adaptability Resilience Sense of appurtenance Identity Sense of well-being, comfort Aesthetic Attractiveness Emotional connection to a place Cultural value Contextual value Accessibility
Neighbourhood scale	Site (location, access, connection to the rest of the city or to other neighbourhoods) Street patterns (connections, use of streets and infrastructure) Public facilities (schools, shops, city hall, museums, and so forth) Green and blue structures (parks, outdoors areas, water systems management) Private investments (housing) Landmarks (heritage buildings, characteristic buildings) Land use (housing quality, mix-use development, public facilities)	Community building Social cohesion Sense of well-being Sense of belonging Social interaction Heritage values Historical values Economic values Sociocultural appurtenance Accessibility Inclusiveness Diversity Neighbourhood identity Resilience Aesthetic

Table 1. Architectural qualities from buildings to neighbourhoods. Source: The author.

environment is valued today based on sustainability rating systems. These systems guide practitioners in their choices towards circularity. In Norway, the most used systems are BREEAM-NOR, FutureBuilt, and the EU Taxonomy.[35] BREEAM Communities is also included as it is available in Norway and offers insights at a neighbourhood scale. The next section introduces these systems and provides information on how they address circularity.

Understanding Circularity Based on Sustainability Rating Systems

As cities change to the rhythm of demolition and (re-)construction, projects are guided by sustainability rating systems and the opportunity to obtain environmental certifications. Sustainability rating systems have the power to implement circularity through several criteria with which a project should comply and can thus support a project's environmental sustainability. A new building must comply with new building codes, materials, and techniques to obtain certification proving its sustainability. A building can be designed using a variety of sustainable design principles: for instance, site-specific considerations, orientation, passive solar issues, the environmental effects of the materials used, material recycling, the use of renewable energy technologies, solid and liquid waste management, water conservation, and designing for disassembly and building reuse. The project will be built based on sustainable design strategies and will be certified as sustainable according to established rating systems. Various research studies have been proposed to analyse and rank different rating systems and their specificities.[36]

This research focusses on four of the rating systems available and used in Norway: the EU Taxonomy, BREEAM-NOR, BREEAM Communities, and FutureBuilt, as they all assess questions of circularity. The most recent versions are used for this work. The EU Taxonomy was established in June 2020, but the annex used for this analysis was first published in June 2023. The earliest version of BREEAM-NOR dates from 2012, but the one focussed on here is the sixth version, from 2022. BREEAM Communities was originally published in 2012, but was first implemented in Norway in 2016. FutureBuilt's oldest criteria date from 2013, but have been updated regularly. The versions used in this research were all updated between 2021 and 2023.

The frameworks they propose focus primarily on the construction and operational phases at the building scale (the EU Taxonomy, BREEAM-NOR, and some of FutureBuilt's criteria). The EU Taxonomy also considers renovation and demolition projects. Some propose solutions at a neighbourhood

scale (FutureBuilt Circular Neighbourhoods and BREEAM Communities). Brought together, these frameworks address questions of circularity at both the building and the neighbourhood scale, whilst considering mainly new projects and urban developments. Yet, no project already in operation has received FutureBuilt Circular Neighbourhoods nor BREEAM Communities certification in Norway at the time of writing, thus leaving a clear gap in the implementation of circularity at the neighbourhood scale, despite existing certification.

In this research, circularity, architectural qualities, and sustainability rating systems are brought together to propose a basis for the development of a holistic framework. This ensures that new project developments will endure over time by being adaptable and resilient, comply with sustainable standards, and contribute to people's well-being and community development. The next section explains the method used to evaluate the frameworks proposed by the four rating systems to assess the gaps around circularity in a holistic manner.

Method of Evaluation

Among the systems available and used in Norway, the criteria for selection were: 1) They must address questions of circularity. 2) They must consider the building and/or the neighbourhood scales. This resulted in four rating systems: BREEAM-NOR, BREEAM Communities, FutureBuilt, and the EU Taxonomy.

A collection of official reports then aims to analyse the criteria a project should comply with and how the criteria address circularity. FutureBuilt proposes one document per criteria[37]; BREEAM-NOR gathers all the criteria in one report to facilitate the quality of a project as a whole.[38] The same holds true for BREEAM Communities.[39] The EU Taxonomy proposes several delegated acts to inform sustainable investments. The one analysed in this article is Annex II of the Environmental Delegated Act, which informs the transition to a circular economy.[40] As the criteria are constantly being revised to adapt to current sustainability challenges, the versions used in this article are the most recent ones available when conducting the research. The criteria are analysed based on the given method: A first reading of the documents allows to understand each criterion's main scope and level of importance. For FutureBuilt, some criteria are mandatory, and some are additional. For BREEAM-NOR and BREEAM Communities, a system of

credits is attributed to each criterion, reflecting its importance vis-à-vis the overall scope. The criteria for the EU Taxonomy are defined in each chapter. A second reading makes it possible to observe whether a precise definition is mentioned for each criterion, whether the aims are specified, whether any specific requirements are mentioned, which documents one should submit, and how thorough the guidelines and methods for fulfilling the criterion are. Are the methods mainly quantitative or qualitative? Are additional documents or an appendix provided? The rating systems make use of similar definitions for different terms.

A first round of coding makes it possible to identify the different perspectives on circularity expressed in the rating systems. For example, BREEAM

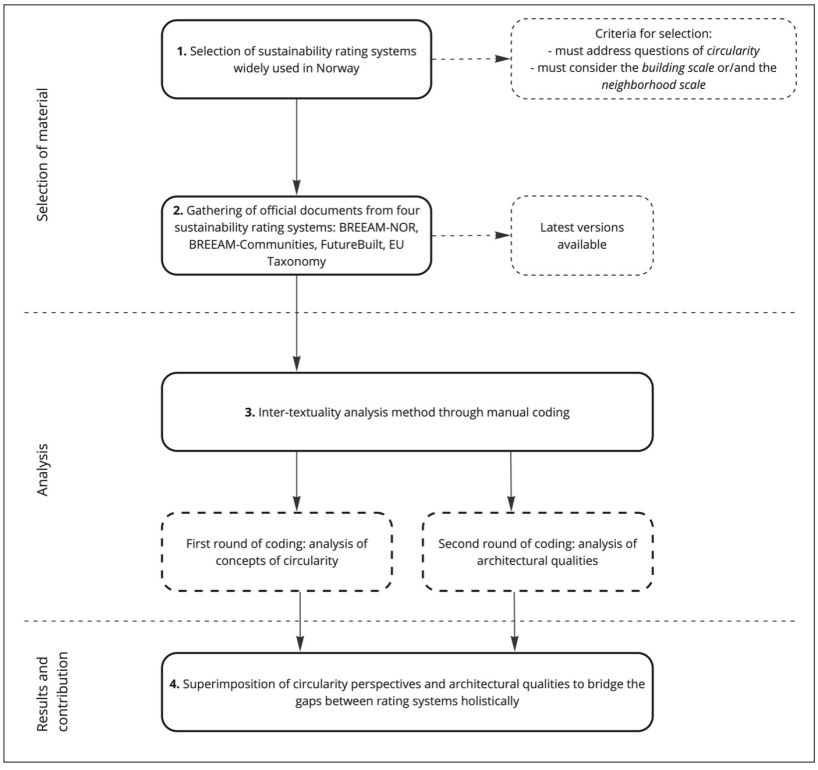

Figure 2. Research design, diagram by the author (Stolz, 2024)

Communities takes an emancipatory perspective by promoting community engagement in the process of planning a neighbourhood, whereas FutureBuilt includes a technocratic perspective when giving guidance on CO2 calculations resulting from the reuse of materials in a project. A second round of coding allows to list the architectural qualities stated in the different criteria. The analysis also facilitates a pinpointing of overlaps: FutureBuilt might refer to BREEAM-NOR in some criteria; BREEAM-NOR might refer to the EU Taxonomy or other standards and frameworks. One criterion can also refer to another criterion, thus showing their interconnectivity and the impact of one characteristic on others. Finally, a structure for a framework that brings together the different architectural qualities and circular perspectives of each rating systems is proposed to address circularity holistically. The research design is illustrated in figure 2.

RESULTS

Different Ways of Defining Circularity

The different rating systems view circularity as sometimes explicit or implicit and define it in different ways. In the case of FutureBuilt, two criteria refer explicitly to circularity: *FutureBuilt circular buildings* and *FutureBuilt circular neighbourhoods*. *FutureBuilt circular buildings* concern only the circularity of material flows during the construction phase, with the aim of helping close the loop of materials in the construction industry. The level of circularity must be a minimum of 50 per cent and must be documented, and the choice of new construction must be documented by an environmental impact survey assessing the best solution between conservation, rehabilitation, or demolition and rebuilding. *FutureBuilt circular buildings* refer to the guidelines from FutureBuilt ZERO, another criterion aimed at zero emissions buildings. The BREEAM-NOR section on adaptability and reusability also emphasizes the possibility to alter and document the use of circular buildings. The main focus of *FutureBuilt circular neighbourhoods* is also on flows of resources. To comply with the criteria, circular neighbourhoods must focus on the circularity of four different flows: of masses, material resources, organic resources, and water and drainage. Each sort of flow should be mapped, and a system boundary should be defined and justified. For the water and drainage flow, following the guidelines from BRREAM-NOR is recommended. Looking back at the analytical framework developed by Marin and De Meulder mentioned above in the theoretical background, the criteria for circular buildings and circular neighbourhoods from FutureBuilt focus on the optimization of flows and adopt a technocratic approach. However, it

is noticeable that these criteria are optional, and to obtain FutureBuilt certification, another set of mandatory criteria must first be fulfilled: criteria regarding social sustainability, innovation, FutureBuilt ZERO (for zero emissions buildings), FutureBuilt ZERO-T green mobility (for zero emission neighbourhoods through transportation), and FutureBuilt criteria for the urban environment and architecture. The criteria for social sustainability and FutureBuilt ZERO-T green mobility are context-based, and thus comprise an emancipatory approach.

BREEAM-NOR assesses circularity based on the notion of lifecycles, end-of-life, material reuse, designing for disassembly, and waste and material flow management. It aims to slow down or close the loop. BREEAM-NOR *materials* criteria give credits to projects that reduce the need for repair and replacement through designing durable projects promoting material reuse or facilitating the ability to reclaim materials for other renovation, disassembly, or demolition works. BREEAM-NOR *waste* criteria also align with circular principles by maximizing the potential for the reuse, recycling, and sorting of waste from the construction and operational stages. BREEAM-NOR *land use and ecology* criteria encourage sustainable land use and promote natural habitat protection and creation. One of the criteria aims to promote and enhance the ecological value of the particular area, which thus aligns with circular principles by creating regenerative systems. BREEAM-NOR *materials* and BREEAM-NOR *waste* focus on optimizing flows and adopt a technocratic approach. However, BREEAM-NOR *land use and ecology* criteria are context-based, hence tending towards an emancipatory approach to circularity.

Whilst BREEAM Communities does not explicitly mention circularity, the notions of local economy, lifecycles, reuse, recycling, and resource efficiency imply circularity. This rating system focusses mainly on the neighbourhood scale and follows three steps of implementation. The first step necessitates understanding the context to establish various core development principles. Here, the economic impact of a project is assessed, and the social impact is understood based on demographic needs and priorities. Various land use and ecology strategies concerning material flows, water systems, and energy are developed. The second step requires a design of the overall layout of the project. Here, community engagement is emphasized, and the enhancement of ecological value implies the creation of regenerative areas. The third step focusses on design principles. The criteria aim at promoting local vernac-

ular architecture and inclusive design for social and economic well-being. Low-impact materials, resource efficiency, and carbon emissions resulting from transport are criteria that promote the reuse of materials and resources as well as energy efficiency. BREEAM Communities focusses mainly on the regenerative development of neighbourhoods by contextualizing the flows. It also includes the optimization of flows, the democratization of flows through community engagement, and innovation with flows by promoting the local economy. It therefore adopts both an approach that is both technocratic and emancipatory.

The EU Taxonomy falls in a different category. As a tool intended to inform economic decisions, the criteria concern not only the built environment, but rather all types of activities. At the same time, the document also includes some clear sections concerning building and demolition projects. The section on *construction and real estate activities* provides information on steps to be taken to substantially contribute to a circular economy. For the construction of new buildings, the first criterion encourages the treatment of construction and demolition waste; the second criterion asks for Global Warming Potential (GWP) calculations for every life stage of the building; the third criterion focusses on the need for designs and techniques supporting circularity, with mention of designing for adaptability and deconstruction; and the fourth criterion aims to reduce the use of primary raw materials. The same first three criteria are applicable to the renovation of existing buildings. The fourth criterion calls for the retention of 50 per cent of the original building. A fifth criterion aims to reduce the use of primary raw materials. When buildings and other structures are demolished or wrecked, the materials and waste need to be sorted and prepared for reuse or recycling. The section on *information and communication* provides information on technical solutions and digital tools for tracking and tracing materials, products, and assets throughout their value chain. The objective is therefore to facilitate the circularity of material flows. As a tool for informing economic decisions, the EU Taxonomy takes a technocratic approach, since it looks primarily at flows of materials.

In summary, FutureBuilt, BREEAM-NOR, BREEAM Communities, and the EU Taxonomy are above all technical manuals and thus focus primarily on flows of materials. However, their understandings of circularity as well as their scale of implementation differ, causing them to extend from the tech-

nocratic at the building scale towards emancipatory at the neighbourhood scale, hence engaging with different methods and disciplines. The following section addresses the different focusses and scales and links the criteria to different architectural qualities.

Different Focus to Reflect Architectural Qualities

From the building scale to the neighbourhood scale or from the design phase to the demolition phase, each phase and scale focusses on different characteristics and therefore different types of quality. In analyses of sustainability rating systems, the criteria often have a prominent focus, and different criteria are mentioned or referred to, showing an interrelation between them. Each criterion touches on architectural qualities from different perspectives, and depending on the quality, a specific type of value is generated.

All the rating systems analysed include criteria related to material flows and waste management during the construction and demolition phases. To facilitate this, architectural qualities following principles such as designing for disassembly, designing for adaptability, and designing for reuse support circularity from a technocratic approach, thus valuing technical know-how and generating primarily technical values. However, various other values are inherent in them: Social values, economic values, and environmental values are also supported, for instance, by the reuse of materials or the adaptability of a design to new needs.

All the rating systems analysed also include criteria related to energy efficiency during the operational phase of a project (building or area development). The focus is both on designing energy efficient systems (waste and water management, ventilation, and lighting at the building scale; waste and water management and transportation at the neighbourhood scale) and on designing with communities (for instance, participatory design, universal design). Hence, these architectural qualities are context-based and generate technical, environmental, and social values. FutureBuilt and BREEAM Communities strongly focus on a context-based approach and social values. FutureBuilt proposes a criterion for *social sustainability*, and BREEAM Communities proposes criteria for *demographic needs and priorities*, *consultation and engagement* (with communities), *inclusive design*, *public realm*, and thus engages firmly with social values.

In the case of several criteria, the focus extends from the building scale to the neighbourhood scale. FutureBuilt ZERO-T, for example, focusses on connectivity and infrastructure at a neighbourhood scale, while BREEAM Communities also focusses on the development of areas. They therefore take a context-based approach and focus on qualities such as accessibility, site location, designing for climate adaptation, and vernacular design. These qualities are connected to the relative location value, site value, ecological values, environmental values, and social values. Indeed, FutureBuilt ZERO-T states: 'Quantifying the effect of measures to change travel habits and means of transport is challenging because it is largely about assessing the potential for behavioural change.'[41]

The focus of other criteria extends from the site to the building by promoting the local economy through the use of local materials and services (BREEAM-NOR) and a circular economy through the reuse of materials and the possibility of reclaiming materials during construction and demolition (EU Taxonomy). The architectural qualities are inherent in the design principles such as designing for disassembly and designing for adaptability and mostly generate economic and technical values.

This evaluation of architectural qualities is linked to the set of values mentioned above in the theoretical background. This section has shown that architectural qualities generate a broad range of values and have the power to support circularity from various perspectives. The original focus of sustainability rating systems was on technical values (by definition, they are technical manuals) and economic values (the EU Taxonomy, for instance, informs sustainable investments). They also acknowledge a connection to contextual and social values when moving from the building scale to the neighbourhood scale. A summary of the different circular perspectives and architectural qualities stated by the different sustainability rating systems are collected in Table 2. The change of scale results in a change of perspectives, from technocratic to emancipatory, thus shedding light on the need to move across and beyond disciplines. This would make it possible to bridge the gap around a holistic approach to architectural qualities for circularity. The following section takes another look at the analytical framework proposed by Marin and De Meulder,[42] and discusses an integration of architectural qualities specified by the rating systems within that framework, suggesting a holistic consideration of values of the built environment.

	Circular criteria	Implementation	Circular perspectives	Objective characteristics
BREEAM-NOR	BREEAM-NOR materials	Material reuse, ability to reclaim material after demolition.	Optimizing flows Contextualizing flows	Building materials and components
	BREEAM-NOR waste	Construction and operational waste management, recycling, reuse, and sorting	Optimizing flows	Building and site materials and components
	BREEAM-NOR land use and ecology	Enhancement of the ecological value of the area through regenerative systems	Contextualizing flows	Site / Location Surface water systems
BREEAM Communities	Contextual approach	Socioeconomic assessment, land use strategies	Contextualizing flows Innovating with flows Democratizing flows	Site, street patterns, public facilities, buildings materials, land use, accessibility (buildings, services)
	Community engagement	Design of the overall layout with the community's engagement	Democratizing flows	Neighbourhood layout, social infrastructure, shared functions
	Design principles	Promoting local vernacular architecture and inclusive design through the reuse of materials	Contextualizing flows Democratizing flows Optimizing flows	Neighbourhoods' shared functions, accesses, land-marks, buildings materials, surface water systems, blue-green infrastructure
FutureBuilt *	FutureBuilt circular buildings	Mapping material flows during construction phase	Optimizing flows	Buildings' materials and components
	FutureBuilt circular neighbour-hoods	Mapping flows of masses, material resources, organic resources, and water and drainage	Optimizing flows Innovating with flows	Building and site materials and components Site / Location, surface water systems
	**Before receiving a circular certification from FutureBuilt, a project needs to comply with previous criteria, which, though not classified as circular, include perspectives such as the democratization and contextualization of flows.*			

Table 2. Circular perspectives and architectural qualities brought together in the sustainability rating systems. Source: The author.

	Circular criteria	Implementation	Circular perspectives	Objective characteristics
EU Taxonomy	Construction and demolition waste	Treatment of construction and demolition waste	Optimizing flows Innovating with flows	Buildings materials and components, waste
	Global Warming Potential (GWP)	Calculations of GWP for every life stage of the building	Optimizing flows Innovating with flows	X
	Designs and techniques supporting circularity	Designing for adaptability and deconstruction	Optimizing flows	Layout, structural system, buildings' materials and components
	Reduce the use of primary raw materials	Reuse of materials, reclamation possibilities	Optimizing flows	Structural system, buildings materials and components
	Information and communication	Technical solutions and digital tools for tracking and tracing materials, products, and assets through their value chain	Innovating with flows	X

Table 2, cont. Circular perspectives and architectural qualities brought together in the sustainability rating systems. Source: The author.

DISCUSSION

The rating systems presented here each approach architectural qualities and circularity differently. FutureBuilt focusses on optimizing material flows across scales, yet issues like social sustainability, innovation, or energy emissions must be addressed before considering the circularity of materials. BREEAM-NOR has a strong focus on the building scale, material flows, and energy emissions; BREEAM Communities takes mostly a neighbourhood approach to trying to conceptualize flows; and the EU Taxonomy informs economic decisions. This section now first discusses the integration of qualities mentioned by the rating systems in the analytical framework to propose a holistic approach to circularity. A second section then discusses the values generated by the different qualities.

Integration of Qualities in the Analytical Framework

Based on the adaptation of the framework represented in figure 1, the characteristics issued by the rating systems are incorporated in the different

perspectives to propose a holistic approach to assessing circularity. This is presented in figure 3. It gives an overview of different criteria and qualities to consider in supporting circularity. Different qualities and design principles are discussed for each underpinning concept: optimizing flows, innovating with flows, democratizing flows, or contextualizing flows.

1. Architectural Qualities for Optimizing Resource Flows

Architectural qualities related to the materials and their qualities: A building's materials, structural system, components, and system of services help optimize the flow of resources. The building layout also facilitates the optimization of flows of materials when it allows for change and flexibility. Design principles like designing for disassembly or adaptability enable buildings, building components, and building materials to be reused with a minimum of waste. All the rating systems exemplify this approach, and the aid of calculation tools and quantitative methods can leverage an optimization of architectural qualities. For instance, Material Flow Analysis (MFA) helps to track the flows and stocks of materials in a system (here: a neighbourhood or a building),[43] and Life Cycle Assessment (LCA) analyses a product or a service's environmental impacts from material extraction through transportation, production, and operation to waste management.[44] It calls attention to the different lifecycle phases that can be optimized to reduce the consequences of construction on the natural environment. Architectural qualities that help optimize resource flows are found mainly at a building scale.

2. Architectural Qualities for Innovating with Resource Flows

All the rating systems also show an interest in innovation. Innovation does not concern architectural qualities in themselves, but rather ways of implementing them (innovating *with* flows). Thus, architectural qualities arising during the concept development phase should be innovative. For FutureBuilt, innovation can be reached through solutions, products, or design concepts that have not been tested previously. For BREEAM-NOR, innovation concerns any new technology, design, construction, operation, maintenance, or demolition method that will improve the sustainability performance of a building and will benefit the building industry. The EU Taxonomy focusses on economic systems and promotes a *product-as-a-service* model (the products refer to some building materials and systems), in which the provider retains ownership of a product and reclaims it at its end of life. The EU Taxonomy also mentions the use of data-driven solutions to drive circularity: for instance, machine learning for the remote monitoring

and predictive maintenance of buildings. Likewise, BREEAM Communities includes one criterion aimed at increasing economic well-being in one specific area. The project (neighbourhood development) should ensure the attraction of investments and the creation of job opportunities. The qualities for innovation can be developed at both a building and a neighbourhood scale and are implemented during the concept development phase.

3. Architectural Qualities for Contextualizing Resource Flows

Architectural qualities to contextualize resource flows are depicted essentially by BREEAM Communities, which mostly refers to the neighbourhood scale. Green spaces, the accessibility of local services, and water systems like local surface water management and rainwater harvesting require an evaluation of the context at a neighbourhood scale. However, some qualities presented by BREEAM-NOR, such as the building function, location, and accessibility, focus on the building scale but require a contextual approach to the site and an analysis of ecological risks. Design principles such as designing for durability and climate adaptation focus on the building scale (how a building can adapt to climate change), but require a contextual approach to understand challenges relative to the site. Nature-based design principles focus on resources present on site and require knowledge of the ecological risks and opportunities in one particular area. BREEAM Communities and FutureBuilt ZERO-T take a contextual approach to mobility planning (green mobility planning). The qualities to contextualize the resource flows are found at both a building and a neighbourhood scale.

4. Architectural Qualities for Democratizing Resource Flows

Democratizing resource flows concerns mainly the neighbourhood scale. It focusses on designing spaces to support social interaction: shared functions, social infrastructure, and neighbourhood facilities. Participatory planning and universal design support inclusivity and help in developing a sense of ownership. Remarkable street patterns and landmarks help people to identify with their neighbourhood, thus democratizing the flow of resources. BREEAM Communities and FutureBuilt largely support these qualities. For the development of areas, BREEAM Communities calls for the involvement of communities through participatory planning. FutureBuilt criteria for social sustainability also favour community engagement; and the validation of their criteria related to social values are only fully completed two years after a project has gone into operation. This ensures that the solutions for social sustainability are adhered to.

Reflecting on different ways to approach circularity in the built environment at different scales progressively extends the palette of architectural qualities. The discipline of architecture engages with broad societal concerns, land use, and site considerations, as well as technical solutions and a need for innovation. This plurality of perspectives requires hybrid modes of inquiry combining quantitative and qualitative methods.[45] The necessity for interdisciplinary and transdisciplinary approaches makes it possible to address all the critical aspects of circularity. This is what is explored in the following section.

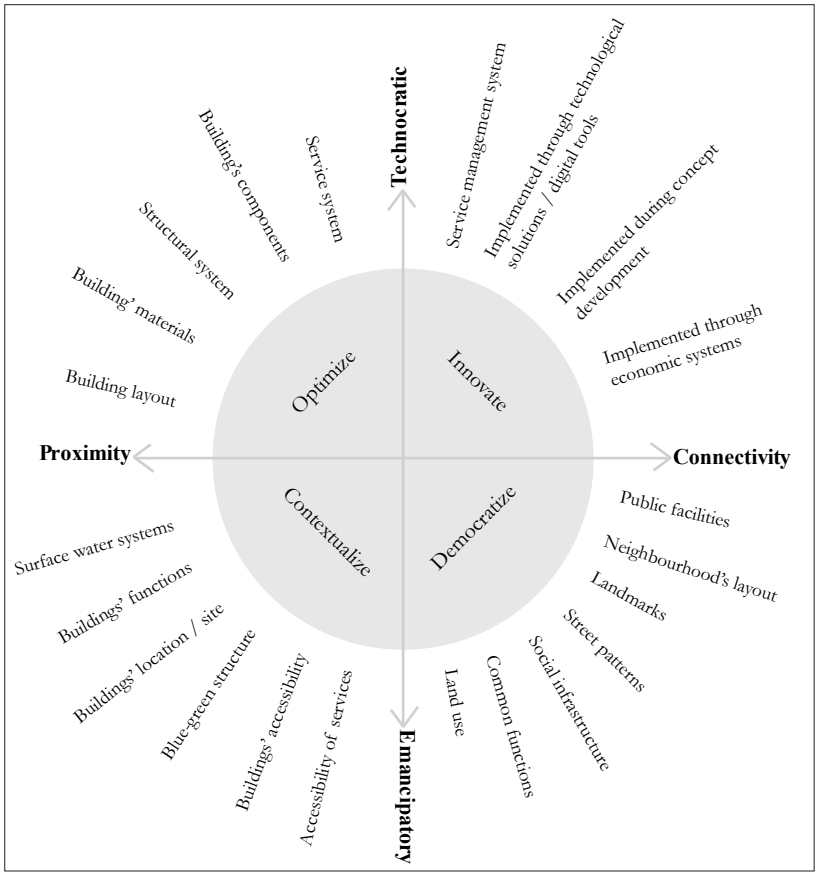

Figure 3: Integration of characteristics in the analytical framework, diagram by the author (Stolz, 2024)

From Defined Characteristics to Diffuse Values: Transdisciplinarity to Support the Circular Development of Neighbourhoods

This second part of the discussion focusses on the values generated by each characteristic and their interconnections across scales. The fact that the criteria refer to other rating systems and other criteria shows that focussing on one specific characteristic will generate value that will affect another characteristic, therefore generating another value. As a result, the effects of one rating system on another support the need for a transdisciplinary approach to circularity.

The values connected to architectural qualities on the building scale are mostly technical values relating to the materials, components, structural system, or services. On the neighbourhood scale, social values are inherent in green spaces, neighbourhood facilities, social infrastructure, shared functions, the accessibility of local services, green mobility planning, and participatory planning. Technical and social values are complemented by environmental values, economic values, use values, exchange values, geographical values, cultural values, identity, innovation, aesthetics, and safety. They are spread across different scales. If the different qualities arise from well-defined objective characteristics, their generated values are all interconnected and build on each other. For instance, the environmental values resulting from local water surface management or rainwater harvesting also generate social values when water management is combined with green spaces, which can also affect a street profile, thus generating aesthetic and identity values. A geographical value is given to a building's location, and its accessibility adds technical and social values. Therefore, adding together different qualities generates new values.

These qualities are addressed by the sustainability rating systems analysed in this article. It is important to note that they are non-exhaustive, and that other systems or frameworks might refer to other qualities. For instance, a building envelope possesses several important qualities. Among them, its airtightness will protect a building against weathering, hence creating technical, material, and environmental values; its choice of material, colour, and texture will provide aesthetic and technical values, and therefore generate a sense of identity.

This generation of values underscores the need to move across disciplines. From buildings to neighbourhoods, it is the connection between values that

makes it possible to understand circularity holistically. This discussion brings with it reflections on the way circularity is understood today. The path to circularity must go beyond reducing energy consumption and closing material loops. It requires an understanding of how one quality affects another one and how the combination of qualities will generate new values and new resources. This holistic consideration of qualities consequently leads to a more integrated approach to circular neighbourhoods.

REFLECTIONS ON A HOLISTIC FRAMEWORK FOR A CONTEXT- AND VALUE-BASED CIRCULARITY

The discussion of architectural qualities and the values connected to them provides insights into qualities to consider for circular neighbourhoods. Based on their interconnection and inclusion of communities in the process, the rating systems studied in this research show a willingness to work in a transdisciplinary manner. Yet, focussing on objective characteristics can sometimes act to the detriment of certain values. Therefore, a structure for a holistic framework combining the various perspectives of rating systems and their scales of implementation has been proposed. It implies working with various disciplines and actors to simultaneously generate new values and resources. A value- and context-based approach can make it possible to respond to the challenges of circularity more holistically, thus expanding the range of qualities from the technocratic to the emancipatory.

With a look back at the theoretical background, the application of circularity to the urban realm should not be restricted to reusing materials and structures to close loops. By building on the analytical framework developed by Marin and De Meulder,[46] a holistic consideration of architectural qualities would facilitate the unlocking of circular potentials in neighbourhoods and therefore generate new resources. Whilst values and qualities draw on earlier discussions, they might change depending on the specific project and its context. Each value and quality are addressed by different actors using different methods. For example, cultural value can be generated by specific landmarks. To achieve this aim, architects must include community participation in the design process to understand needs and create or preserve a sense of ownership or identity. Another example is the goal of innovation arising from building materials. Here, the field of industrial ecology might collaborate with manufacturing to develop digital tools that facilitate the automation of the tracking of material flows. The intent is to bring several

actors and disciplines together around common values, thus offering an integrated approach to circularity. Circularity and transdisciplinarity are linked today through context-based approaches and simultaneities between disciplines and actors.

This discussion underscores the importance of a transdisciplinary approach to qualities of the built environment, from buildings to neighbourhoods, to support circularity. Consequently, a holistic framework for circular neighbourhoods is suggested. The discipline of architecture extends into various fields of knowledge. A holistic approach to circularity requires simultaneities between structural engineering, industrial ecology, and manufacturing at the building scale, and urban planning, geography, and social sciences at the neighbourhood scale. Furthermore, incorporating the knowledge and experiences of private or public actors, companies, or communities makes it possible to go beyond the specific disciplines and generate new ideas and solutions.

CONCLUSION

In summary, the application of circularity to the built environment today is increasing, although still quite techno-centred. This article underscores the need for a context-based approach to circularity in the built environment, one that guides transdisciplinarity towards responding to questions related to climate change. On one hand, the challenge of circularity seems to be addressed through quantitative methods that approach architectural qualities from a technocratic perspective. For example, MFA, LCA, circular economic systems, and digital tools guide the shift towards circular environments. Corresponding design principles are developed: Designing for disassembly and adaptability favours a development of techniques to reclaim materials and components at the end of a building's life and reuse them; nature-based design and designing for climate adaptation focus on the adaptability of different materials to climate change. On the other hand, an analysis of architectural qualities shows that inherent subjective experiences also have the potential to support circularity and generate values. Even though sustainability rating systems might be mostly techno-centred, some also show an interest in responding to questions related to social sustainability and community engagement or behaviours, for instance. Some criteria overlap or affect others through scales and across rating systems, thus showing the need for a holistic framework to approach circularity.

Each of the systems analysed addresses fragments of circularity, which, articulated through different circular perspectives, take a holistic approach to circularity. This article has therefore reviewed existing criteria assessing circularity by bringing the fragments of circularity together and assessing the gaps holistically. By adapting the analytical framework proposed by Marin and De Meulder,[47] a holistic approach to architectural quality is provided to inform rating systems and enable them to adopt a more integrated approach to circular environments. This contributes to the growing topic of circularity by expanding its definition and linking it to architectural qualities, hence making the topic more tangible for practitioners. For instance, through assessing the effect of objective characteristics on values and subjective experiences, starting from the conception phase of a project, by contextualizing and democratizing flows, practitioners can utilize this holistic approach to create circular neighbourhoods that respect planetary boundaries as well as support a robust social foundation. Each objective characteristics should be addressed based on the multiple circular perspectives, and each value emerging from them must be analysed in advance.

A limitation of this study is the need for more empirical material to understand how qualities and values evolve in a changing environment. At this stage, the article proposes a composite set of qualities for circular neighbourhoods that must be considered as an attempt to respond to the gaps expressed in the introduction. The discussion on architectural qualities and how they are connected to values assists in rethinking how the built environment is valued today and stresses the need for transdisciplinarity, whilst also suggesting the need for further investigations. A structure for a framework is proposed, and further research could examine how to apply this framework to a specific neighbourhood, how to put it into practice, how to test and verify it, and how to articulate different synergies coming from different fields of knowledge.

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NOTES

[1] J. Kirchherr, D. Reike, and M. Hekkert, 'Conceptualizing the circular economy: An analysis of 114 definitions', *Resources, Conservation & Recycling* 127 (2017), pp. 221–32, https://doi.org/10.1016/j.resconrec.2017.09.005 [all URLs here accessed in December 2024].

[2] F. Vanhuyse, N. Haddaway, and M. Henrysson, 'Circular cities: an evidence map of research between 2010 and 2020', *Discover Sustainability* 2 (2021), p. 50, https://doi.org/10.1007/s43621-021-00059-2.

[3] H. Birgisdóttir, A. Bjørn, A. Branny, C. Clausen, A. Fanning, I. Fetzer, N. Francart, L. Grcheva, M. Heide, E. Lassen, J. Leonardsen, F. Moberg, R. Nørgaard, D. Pham, K.K. Rasmussen, K. Raworth, M. Ryberg, and E. Sahan, *Doughnut for Urban Development: A Manual*, ed. Dani-Hill-Hansen and Kasper Guldager Jensen (Copenhagen: Arkitektens Forlag, 2023).

[4] W. Steffen, K. Richardson, J. Rockström, S. E. Cornell, I. Fetzer, E. M. Bennett, R. Biggs, S. R. Carpenter, W. de Vries, C. A. de Wit, C. Folke, D. Gerten, J. Heinke, G. M. Mace, L. M. Persson, V. Ramanathan, B. Reyers, and S. Sörlin, 'Planetary boundaries: Guiding human development on a changing planet', *Science*, 347/6223, (15 January 2015), https://doi.org/10.1007/s43621-021-00059-210.1126/science.1259855.

[5] Birgisdóttir et al., *Doughnut for Urban Development: A Manual*, p. 9.

[6] J. Marin and B. de Meulder, 'Interpreting Circularity: Circular City Representations Concealing Transition Drivers', *Sustainability*, 10/5 (2018), p. 1310, https://doi.org/10.3390/su10051310.

[7] Vanhuyse et al., 'Circular cities', p. 50.

[8] M. K. Wiik, S. Homaei, L. Henke, S. M. Fufa, and K. Knoth, 'A comparative assessment of building sustainability schemes in Norway', paper presented at the IOP Conference Series: Earth and Environmental Science in 2023, https://doi.org/10.1088/1755-1315/1196/1/012045.

[9] BREEAM-NOR v6.0 New Construction, Technical manual SD5076NOR', 2022, retrieved from the Norwegian green building council Grønn Byggallianse website: https://byggalliansen.no/sertifisering/om-breeam/manual-verktoy-og-hjelp/breeam-nor-manual-og-verktoy/#1646040257139-06f63e7f-55e5.

[10] Official documents retrieved from the FutureBuilt website: https://www.futurebuilt.no/FutureBuilt-kvalitetskriterier.

[11] 'Annex II: Transition to a circular economy', of the Text of the Environmental Delegated Act and amending the Disclosures Delegated Act, Brussels, 27.6.2023 C(2023) 3851 final, retrieved from the European Commission website: https://finance.ec.europa.eu/regulation-and-supervision/financial-services-legislation/implementing-and-delegated-acts/taxonomy-regulation_en.

[12] M. K. Wiik et al., 'A comparative assessment of building sustainability schemes in Norway'.

[13] 'BREEAM Communities Technical Manual, SD202–1.2:2012', retrieved from the Norwegian green building council Grønn Byggallianse website: https://byggalliansen.no/sertifisering/om-breeam-communities/..

[14] D. T. Doan, A. Ghaffarianhoseini, N. Naismith, T. Zhang, and J. Tookey, 'A critical comparison of green building rating systems', *Building and Environment 123* (2017), pp. 243–60.

[15] M. Marjanović, W. Wuyts, J. Marin, and J. Williams, 'Uncovering the Holistic Pathways to Circular Cities—The Case of Alberta, Canada' (2022), pp. 65–87, https://doi.org/10.54175/hsustain1020006.

[16] F. Adedire and M. Adegbile, 'Assessment of housing quality in Ibeju-Lekki periurban settlement, Lagos State, Nigeria', *Acta Structilia*, 25/1 (2018), pp. 126–51.

[17] Marin and de Meulder, 'Interpreting Circularity'.

[18] G. Lucertini and F. Musco, 'Circular City: Urban and Territorial Perspectives', in *Regenerative Territories, Dimensions of Circularity for Healthy Metabolisms*, ed. Liberta Amenta, Michelangelo Russo, and Arjan van Timmeren (Berlin et al.: Springer, 2022), pp. 123–34.

[19] M. Marjanović, W. Wuyts, J. Marin, and J. Williams, 'Uncovering the Holistic Pathways to Circular Cities–The Case of Alberta, Canada', *Highlights Sustain*, 1/2 (2022), pp. 65–87, https://doi.org/10.54175/hsustain1020006.

[20] Marin and de Meulder, 'Interpreting Circularity'.

[21] Marin and de Meulder, 'Interpreting Circularity'.

[22] Marin and de Meulder, 'Interpreting Circularity'.

[23] M. Rönn, 'Quality in Architecture: A Disputed Concept', paper presented at the ARCC Spring Research Conference, Lawrence Technological University, Southfield, Michigan, 2011.

[24] Beata Sirowy, 'Positivism and postpositivism', in *Phenomenological Concepts in Architecture: Towards a User-Oriented Practice, A PhD Thesis* (Oslo: Arkitektur- og designhøgskolen i Oslo, 2010), p. 51.

[25] John R. Staver, 'Constructivism and Realism: Dueling Paradigms', in *Second International Handbook of Science Education*, ed. Barry J. Fraser, Kenneth G. Tobin, and Campbell J. McRobbie (Springer, 2012), p. 1019.

[26] M. Rönn, 'Quality in Architecture—Learning from History, Practice and Competitions', in *Architecture as Human Interface 2012: The 4th Symposium of Architectural Research in Finland—The 4th International Conference on Architectural Competitions*, ed. Mina Di Marino and Helena Teräväinen (Aalto University publication series ART + DESIGN + ARCHITECTURE, no. 7 [2014]). Aalto ARTS Books, http://urn.fi/URN:ISBN:978-952-60-5833-7.

[27] Rönn, 'Quality in Architecture'.

[28] S. Brand, *How Buildings Learn: What Happens After They're Built?* (New York: Viking, 1994).

[29] B. Jaillon, U. Napolitano, and F. Boutté, *Paris Haussmann: Modèle de ville* (Paris: Editions du Pavillon de l'Arsenal, 2017).

[30] C. Alexander, S. Ishikawa, M. Silverstein, M. Jacobson, I. Fiksdahl-King, and S. Angel, *A Pattern Language: Town Buildings Construction* (New York: Oxford University Press, 1977).

[31] Alexander et al., *A Pattern Language*.

[32] K. Lynch, *The Image of the City* (Cambridge, MA: The MIT Press, 1960).

[33] J. Metzger and S. Wiberg, 'Contested framings of urban qualities: Dis/qualifications of value in urban development controversies', *Urban Studies*, 55/10 (2018), pp. 2300–316, https://doi.org/10.1177/0042098017712831.

[34] O. Gocer, Y. Wei, A. Ozbil Torun, S. Alvanides, and C. Candido, 'Multidimensional attributes of neighbourhood quality: A systematic review', *Heliyon* 9/11 (2023), p. e22636, https://doi.org/10.1016/j.heliyon.2023.e22636.

[35] M. K. Wiik, S. Homaei, L. Henke, S. M. Fufa, and K. Knoth, 'A comparative assessment of building sustainability schemes in Norway'.

[36] Wiik et al., 'A comparative assessment of building sustainability schemes in Norway'.

[37] Official documents retrieved from the FutureBuilt website: https://www.futurebuilt.no/FutureBuilt-kvalitetskriterier.

[38] 'BREEAM-NOR v6.0 New Construction, Technical Manual SD5076NOR'.

[39] 'BREEAM Communities Technical Manual, SD202–1.2:2012'.

[40] 'Annex II: Transition to a circular economy, of the Text of the Environmental Delegated Act and amending the Disclosures Delegated Act'.

[41] 'FutureBuilt ZERO-T green mobility criteria', p. 3.

[42] Marin and de Meulder, 'Interpreting Circularity'.

[43] M. Dijst, E. Worrell, L. Böcker, P. Brunner, S. Davoudi, S. Geertman, R. Harmsen, M. Helbich, A. A. M. Holtslag, M.-P. Kwan, B. Lenz, G. Lyons, P. L. Mokhtarian, P. Newman, A. Perrels, A. P. Ribeiro, J. R. Carreón, G. Thomson, D. Urge-Vorsatz, and M. Zeyringer, 'Exploring urban metabolism—Towards an interdisciplinary perspective', *Resources, Conservation and Recycling* 132 (2018), pp. 190–203, https://doi.org/https://doi.org/10.1016/j.resconrec.2017.09.014.

[44] M. A. Curran, 'Life Cycle Assessment: a review of the methodology and its application to sustainability', *Current Opinion in Chemical Engineering* 2/3 (2013), pp. 273–77, https://doi.org/10.1016/j.coche.2013.02.002.

[45] I. Doucet and N. Janssens, *Transdisciplinary Knowledge Production: Towards Hybrid Modes of Inquiry in Architecture and Urbanism* (Berlin et al.: Springer Science+Business Media, 2011), https://doi.org/10.1007/978-94-007-0104-5.

[46] Marin and de Meulder, 'Interpreting Circularity'.

[47] Marin and de Meulder, 'Interpreting Circularity'.

HOW TO MAP THE ARCHITECTURE OF A CHANGING SOCIETY? AN APPROACH TO EXAMINING SCHOOLYARDS IN STOCKHOLM

Matilde Kautsky

ABSTRACT

The present-day schoolyard is the material reality of a multitude of ongoing lives, histories, memories and spatial relations. The aim of this article is to discuss an approach used to entangle some of the spatial and temporal parts of that palimpsest—the architectural and societal events that have shaped the physical environment of the schoolyard—by asking how changes in society are materialized in the architecture of our everyday places. The approach can be described as a lens used to explore the architecture of schools and schoolyards in Stockholm, examining how their spatiality and temporality have been affected by societal changes and shifting societal views on children. The lens consists of three methods, morphological analyses, historical analyses, and visual research methods. The morphological analyses capture the spatial configuration, the historical analyses map the contemporary ideological processes that influenced and shaped the design of the built environment, while the visual research methods are a way of creating maps, drawings, and photographs of the morphological and historical analyses, representing findings and asking new questions of the analyses. The article concludes that it is important to balance the three parts of the lens in order to strengthen the narrative on how entangled the present material reality of schools is with past architectural and societal events.

KEYWORDS

schools and schoolyards, morphological analyses, historical analyses, visual research methods

INTRODUCTION

> Through interpreting the spaces that are planned and built for children we can understand the strivings of a past society, but also see the changes and restructurings this society has done clearer.[1]
>
> Håkan Forsell

HOW ARE CHANGES IN SOCIETY MATERIALIZED IN THE ARCHITECTURE OF OUR EVERYDAY PLACES?

The architecture of the everyday places investigated comprises *places for children* in the city, and, more specifically, spaces for education, discipline, and play—schools and schoolyards. 'Places for children' are the places made by adults for children (for instance, schoolyards), as opposed to 'children's places', which are places children point out or create for themselves.[2] The present-day school and schoolyard is the material reality of societal ideals, norms, and values, as well of a multitude of ongoing lives, histories, and memories, a palimpsest of places and spatial relations. The focus of this article is a methodological discussion of an approach used to entangle some of the spatial characteristics of public primary schoolyards in Stockholm, Sweden, and to map the architectural and societal events that have been part of shaping the physical environment—the materialities—of these schoolyards. As Forsell argues, by studying built environments we learn more about what kind of society the spaces of schoolyards were designed and planned for. We learn about the ideals, norms, and values materialized in the architecture of buildings, streets, and public spaces.[3] By studying this, we also learn who or what was part of the process and who or what was not included in the materialization.

The main objective of the article is to discuss *how* to map the architecture of a changing society. To be able to do this mapping (of how changes in society are materialized in the architecture of places and buildings used in our everyday lives), a specific approach is proposed. It is a combination of three methods, and I argue that the understanding of the on-going transformations of the built environment in relation to changing societal ideals increases when this approach is applied. As a method, the focus of this article is on presenting and discussing the methods, while the results of the research project are presented elsewhere.[4] A discussion of transdisciplinarity—being situated within architecture and urban design, disciplines that commonly

borrow and combine methods from other disciplines—is welcome, as the approach discussed borrows methods from two other disciplines: history and visual research. A definition of transdisciplinarity from which to start this discussion is found in *Spatial Cultures*, in which Griffiths and Lünen define transdisciplinarity with the help of Ramadier:

> . . . transdisciplinarity seeks to 'confront' multiple disciplinary perspectives and 'articulate' their contradictions rather than resolve them into a single model or juxtapose their differences. 'Articulation' in this sense involves an active acknowledgement of the multidimensional complexity of reality in order to reconstruct the object of study such that contrasting and sometimes contradictory disciplinary realities are preserved rather than simplified . . .[5]

As Griffiths and Lünen argue, in their understanding of transdisciplinarity, confronting and articulating the complex reality as well as multiple disciplinary perspectives are of importance. While the three methods in the approach discussed do not confront or articulate contradictions between the disciplines in the sense of Griffiths and Lünen, the combination of the three methods is useful in grasping parts of the complexity of reality—so as to be able to answer the question of how changes in society are materialized in society. The article (as such) does not position itself as being transdisciplinary, but the discussion of transdisciplinarity in relation to the approach is continued (in the Discussion section) after the research material and method have been presented.

ON SCHOOLS AND SCHOOLYARDS

Apart from schools being formative institutions through their educational and disciplining function, school buildings are also one of the architectures that shape public space and materialize education.[6] Schools are part of many people's everyday lives, for example, the children attending the school, their caretakers, and the school staff. Stockholm had approximately 270 primary schools in 2019 and still has today (2024). Of these 270 schools, roughly 150 are public primary schools.[7] The schools were constructed at different points in time and are distributed evenly across the city, making them one of the more commonly visible institutions.

The term *school* comprises the built structure, the educational institution, and social spaces. Bacharel, Heitor and Alegre have referred to it as a *school-place*

so as also to include the neighbourhood community.[8] In this article, *school* is used to include all of the aspects mentioned above, from the building to the organization and the activities within it. *Schoolyard* is used when writing specifically about the open outdoor space adjacent to the building, primarily used for play during recess and after the end of the school day. This outdoor space is usually surrounded by a low fence in order to indicate a differentiation between the schoolyard and the surroundings. Apart from this, schoolyards in Sweden are open for anyone to use and access when the schools themselves are closed. The shape and visibility of the schoolyard are constituted by the surrounding (school) buildings and streets—the urban context. They are relational—the (school) buildings, schoolyards, public spaces, and the rest of the city. To understand the spatialities of the schoolyard and how they have changed over time, the context of the neighbourhood and the city have to be included in the analyses.

The process of building a school is often quite long, from early inquiries of the potential need for more schools in the municipality, to financing, planning, and finding the right location for the school, to its design and construction. The societal ideals, materialized through the regulations and guidelines that play a part in shaping the process, are already set when the planning for a new school starts, thus making the guidelines and regulations in a way old. Old in the sense of what society was striving for earlier, especially when taking into account the process behind investigating, formulating, and agreeing on new guidelines and regulations. Lundin calls this 'frozen ideology'.[9]

Apart from the long process involved in building a school, many schools go through several renovations and modifications during their lifespan due to wear and tear, demographic changes, and changing ideals of education. Sometimes the form and shape of the school change, but, more commonly, the new needs and functions are adapted to the existing spaces. It is less likely that spatial and configurational relations between the school building and the schoolyard, or the relation to the surrounding neighbourhood are changed. The societal ideal influencing the guidelines and regulations materialized in a particular school's form and shape is thus still present in the topology of the school today. Today's schools are therefore a palimpsest of frozen ideologies, current ideals, and the everyday lives in and around them. While the schools of today hence do retain the original design, form, and configuration to a great extent, their architecture is in an on-going process of change at the same time.

THE LENS

The approach discussed in this article is used as a lens. A lens works in two directions: either focussing on an object, topic, or subject matter, or dissipating and distorting the subject matter to instead include several other objects in the picture or area of study. When used in a magnifying glass, a lens enlarges objects close up, while in binoculars, it makes distant things seem closer. As a researcher within architecture and urban design, who lives in the Swedish society of today, I look through the lens to explore the architecture of schools and schoolyards in Stockholm, their spatiality and temporality, and how society has changed, including societal views on places for education and play. Through the lens, changes in society traceable in the architecture of the schools emerge and become visible. The view through the lens focuses the gaze by combining three methods, a triangulation consisting of morphological analyses, historical analyses, and visual research methods.[10] Triangulation, as in the use of multiple methods and/or multiple sources of data, is a common approach in research, and three data sources or three methods are often used to ensure the credibility and confirmability of the research.[11]

Combining and intertwining the three methods in the lens in the way suggested here is of importance, since the three methods operate in different ways and are based on different empirical materials, from the everyday spatial reality of Stockholm, to historical documents and ways of visualizing findings. Were one of the methods to be removed, the research question could not be answered in the same way. If, for example, the study were based solely on morphological and historical analyses, the critical visuality through which both new questions can be asked and findings represented would be lacking. With only morphological analyses and visual methods, the research would lack a temporal perspective, making it hard to track changes in society. Combining the methods in one lens thus facilitates an approach to answering the research question. The aim of the approach is to answer the question: How are changes in society materialized in the architecture of our everyday places? This question is operationalized in the following sub-questions:

- How are the spatial configuration, form, and materiality of architecture connected to societal changes and how can the traces of societal changes be analysed, understood, and visualized as well as contextualized?

- In what way may the analyses, understandings, and visualizations of societal changes contribute to a discussion of societal perspectives, politics, and power relations as represented through architecture?

Apart from the above questions, a few other specific questions are posed: addressing changes in society, the materialization of societal ideals, how this influences relational spatial interactions between the school and the city, and how to visualize and map the findings. Each of the methods contributes its own answers to the questions.

THE APPROACH—THE THREE METHODS

Morphological analyses investigate spatial aspects, while historical analyses investigate the societal discourses that have been part of shaping the built environment. Visual research methods are used as one way of collecting data, posing new questions regarding the analyses, and representing findings. Morphological analyses are network analyses used to map the relational spatial aspects of public schools and schoolyards in Stockholm based on the field of space syntax.[12] To capture the relationality the analyses are conducted on several scales: the city level, the neighbourhood level, and the street level. On the city level, all primary schools of Stockholm are included, while on the neighbourhood level, only public primary schools are included, and on the street level, a selection of public primary schools are analysed. The selection is based on a range of criteria, for instance, location, year of construction, and schoolyard size. The historical analysis comprise literature studies of state documents and a journal of architecture (with both of these understood here as representing a formal part of society), which are read selectively, searching for information and discussions concerning schools and schoolyards in general and specifically also concerning what programmes and activities in the schoolyard were regarded as important. The visual research methods combine the morphological and historical analyses in maps, diagrams, and drawings so as to visualize connections and findings and push the research further through formulating new questions.

MORPHOLOGICAL ANALYSES

The architecture and visibility of schools are investigated using spatial configuration analyses. The analyses reveal where in the neighbourhood the schools are located, both in relation to the local neighbourhood as well as beyond. Additionally, the analyses describe what is outside of the schoolyards and where other societal services are found close to the schools, as well

as capturing the enclosure of the schoolyards. The investigation of visibility describes how visible or hidden the schoolyards are from the adjacent streets, and what kind of societal services are within view from the schoolyards. The local exposure rate, another spatial measure, describes how embedded the schoolyards are in their surroundings.

The morphological analyses provide answers with respect to the socio-spatial phenomena of the school and investigate the relational spatial aspects between schools, streets, and neighbourhoods. The combination of the societal and how it informs and interplays with the spaces of the built environment is of interest here. The socio-spatial phenomena of the school are mapped by overlaying the spatial aspects with information about educational and play spaces for children and ideals of urban planning. The aim of the analyses is therefore to capture how societal ideals of discipline, education, and play are spatially materialized in the built environment, along with the ordering of the city, that is, where the school is located, next to what, and visible from where. The morphological analyses are based on two different models: a model of the street network of the specific city, the axial map, and the model of visual fields, isovists.

The street network analyses come from the research field of space syntax, a configurational approach, originally described by Hillier and Hanson in 1984.[13] Legeby, Koch, and Miranda Carranza have developed configurational analyses with the aim of discussing representational aspects and power relations and applied them in a study of schools in Uppsala, Sweden.[14] Others who have developed the analyses that are important for understanding the analyses in this article are described below in the section 'The Novelty of the Approach'.

The idea of space syntax is that 'human societies order their spatial milieu in order to construct a spatial culture, that is, a distinctive way of ordering space so as to produce not actual social relations … but the *principles for ordering social relations*'.[15] Hillier and Hanson understand space as part of ordering social relations, and have developed a theory for modelling this by representing space as a network for being able to study the configuration of space.[16] The model representing the street network, or rather the network of public spaces throughout the city, is the axial map. This model consists of the fewest and longest straight lines, drawn to capture how the public spaces (for instance, streets, squares, and parks) of the city are configured. By using an axial map

to analyse how schools and local neighbourhoods are spatially related to each other, it is possible to capture the 'principles for ordering social relations' in these places by means of centrality, or integration, maps. These spatial principles are mapped by analysing the location of the schools in relation to the centrality of the network on both the neighbourhood level and beyond. Additionally, what sorts of other societal services are easily accessible from the schools is also mapped. This mapping makes it possible to see what other kinds of everyday activities take place around the schools, thus enhancing the understanding of how supportive the environment around schools is for everyday lives.

The visual field analyses describing the visibility of the schoolyards are conducted by using isovists. Benedikt defines isovists as follows: 'An isovist is the set of all points visible from a given vantage point in space and with respect to an environment.'[17] Benedikt goes on to develop a way of describing space by means of isovists and isovist fields, through which the perception of space and behaviours in space is discussed with a focus on 'environment perception' rather than 'object perception'.[18] This is in line with the intentions of the question underlying the research project, to display the possible perceptions of the schoolyard environment, and of the neighbourhood, through mapping the visibility of schoolyards. The isovists capture what it is possible to see from one specific location in the schoolyards, or from the street looking into the schoolyard. The use of isovists in this way is inspired by Vaughan, who uses them to capture the degree of visibility of synagogues in nineteenth-century London.[19] Besides displaying the visibility of the schoolyards, the isovists of the schoolyards are combined with geographic information system (GIS) data, including, for example, services in the neighbourhood of the school. With this combined analysis of visibility and non-residential uses, we learn what other kinds of services are visible from the schoolyards, and hence augment the understanding of the context of the schools and their 'urban embedding'. The urban embedding of schoolyards is mapped using the local exposure rate, indicating how schools with similar presence in the network can be visible to different extents. The difference between schools in different contexts but in similar spatial configurations comes to the fore, thus increasing our understanding of how changes in societal ideals concerning schools play a role in their presence in our everyday movements in the city. In the morphological analyses, the axial line map is used as a model of Stockholm, along with datasets about the public and independent schools in the Stockholm municipality and the number of pupils and year of construc-

tion. Additionally, GIS data about other services in the municipality such as parks, population, and public transport is used in the analyses.

HISTORICAL ANALYSES

The historical context is needed to describe the society of the past. Through analysing a selection of historical material, how these sources describe the school and schoolyard, and recommendations for programmes and activities in schoolyards, ideals from different times become visible. The spatial ideals of education and play presented in the historical material are brought forward in the historical analyses. The sources used in the analyses are state guidelines and regulations for schools published from 1865 to 2015, *The Swedish Journal of Architecture*, a selection of state reports (SOUs), and archival construction drawings. The first two sources, the guidelines and *The Swedish Journal of Architecture*, are the main sources; through them, along with the secondary sources, the historical context of the schools and the changes in the guidelines are described.

While the historical context serves as a key representing societal ideals that have informed the design and location of schools and schoolyards, the historical analyses are used to understand as part of what now 'frozen ideology' public primary schools in Stockholm were constructed and in what sort of frozen ideology we live our everyday lives today. The historical sources were searched for specific keywords like playground, school, schoolyard, children, play, school building, play equipment, and children's rights, and read in a selective and directed way. The aim was to find out how schoolyards are described in the historical material, what spatialities of schoolyards are discussed, and what sort of programmes and functions the schoolyards are intended to support. Furthermore, aspects mentioned in the guidelines about the localization of schools and size recommendations for schoolyards were taken into account. As few of the sources have been digitized, the search was conducted manually in all of them.

In Sweden, there are eight different state guidelines for how to build the best schools, with the earliest of them published in 1865 and the present one published in 2015. The time between the publishing of the guidelines varies, where the shortest time between two guidelines is eleven years (that is, between the guideline published in 1944 and the one published in 1955) and the longest time thirty-five years (that is, between the guideline published in 1979 and the one from 2015). The relevance of discussing frozen ideolo-

gies increases with the time between the publication of new guidelines. The societal ideals in Sweden around 1979 were in many respects different than those in 2015.

The political decision in 1865 to create elementary schools (Folkskolor) open and available to all and dispersed over the country was followed by the first state architectural guideline. While all the guidelines were published by a state authority, the expertise of the particular authority has changed, from the building and planning department (nineteenth century) to the education department (1920–1979), and then back again to the building and planning department (2015 until the present). Some of the guidelines were published following the adoption of new curriculums, thus showing a connection between how ideas of education are materialized in architecture.

The first issue of *The Swedish Journal of Architecture,* a journal for 'analysing, discussing, and documenting Swedish architecture and urban design', was published in 1901 and has been published continually since then.[20] The continuity of the journal provides an excellent context for the state guidelines regarding how discussions about schools and schoolyards were conducted within the profession over a long period. To further understand and contextualize the discussions around places for children in the city, a selection of state reports (SOUs) were consulted. These state reports have a specific position in Sweden; in many cases they are written by politically appointed experts. Furthermore, the outcomes of the SOUs often end up in a guideline, regulation, or recommendation.[21] The SOUs used were selected based on whether they mention the spatial aspects or the architecture of schools, schoolyards, or other places for children. Since there is a large number of SOUs, the selection of them concentrated on the period which had an impact on the most recent guidelines, hence SOUs mainly from the 1960s and 1970s.

Archival construction drawings were consulted for a selection of public primary schools in order to study the architectural changes, from the time of construction until today, in detail. The drawings of the schools were collected and organized according to construction time, and by layering them on top of each other, it is possible to visualize how the exterior configurations of schoolyards and school buildings have changed. Drawings of the schools were studied with a focus on the schoolyards so as to see if spatial changes were made to the schoolyards through the addition of new buildings or new programmes and functions, for example, through the addition or removal of

play equipment in the schoolyard. Based on this reading of the drawings, it is possible to relate how the space of the schoolyard has been adapted to the changing programmes and functions of the schoolyard.-

VISUAL RESEARCH METHODS

Visual research methods are a field within social studies and, according to Rose, visual research methods involve actively using images (or other visual material) as one type of data within research.[22] In the research presented here, the visual data consists of photographs, diagrams, drawings, and maps. They are used in combination with text to explore the morphological and historical analyses, and, by moving between visual materials, the text and analyses respond to the research questions. The approaches to visualization bring forth different aspects, and combining them makes it possible to engage with new research questions. The photography, diagrams, and drawings in this research correspond to different scales and time perspectives.

The photographs are from site visits and depict the particularities of a selection of schoolyards, including the school buildings and surroundings of these schoolyards. This comprises the most material and close-up scale to the schoolyards within the research project. The photographs were taken with two different aims. The first is as a documentation of the schoolyard at that particular moment, where the photographs are descriptive of the entire schoolyard environment, school building, and their surroundings. As a memory, they are thus of assistance when writing about that specific schoolyard later on (see fig. 1). These pictures are standard architectural photographs depicting building properties. Based on the photographs, it is possible to understand the character of the buildings, approximate the time at which they were constructed, the type of building and its function, as well as the spatial interrelations between different buildings, public spaces, and streets. The second type of photograph aims at capturing the visibility of the schoolyards and the visibility of the surroundings from the schoolyard. These photographs can be thought of as *photographic isovists*, shot from different heights (such as, for instance, the different heights of children and adults), and attempt to picture what might possibly be within the visual field of humans of different heights (see fig. 2). The photographs were also shot from a range of different viewpoints along the interface of the schoolyard in order to explore if and/or how the photographs inform the interpretation of the isovist analyses.

A range of scales is used in the maps in the research project. They range from a scale able to include the entire municipality of Stockholm, to the neighbourhood level, the street level, and the very local and particular as a selection of specific schoolyards. The maps of the entire city and the neighbourhood capture, for example, the location of the schools in Stockholm and whether they are close to main streets based on urban form and the centrality of the streets (fig. 3). The maps of the street level show the isovists of the schoolyards, while the very local and particular drawings of a selection of schoolyards are archival construction drawings showing changes in the built environment of the schoolyards over time. The maps of the city, neighbourhood, and street level represent the present situation of the schoolyards, while the very local and particular drawings of the schools represent modifications and renovations at specific times, from the time of construction until the present. The maps 'make social power relations visually tangible', as Troiani and Ewing write, and if consistently worked on and interpreted, the maps of

Figure 1. Photograph as a documentation of a schoolyard and a school building in Södermalm, part of the inner city of Stockholm. Photograph by the author

the street network and the centrality of the schools discuss power relations.[23] The archival construction drawings of a selection of schools, on the other hand, offer a narrative on how these particular schoolyards have changed (or not) over time, including societal changes.

The visibility of the schoolyards from the street, and, inversely, the visibility of the street from the schoolyard, is explored through the use of isovists (fig. 4). The maps record the isovists, how they extend into the neighbourhood or how they are interrupted by buildings and height differences. Through studying these visualizations, knowing the year when the school was constructed and the neighbourhood, and what ideals the state guidelines presented about schools at this point in time, we learn about how the schools are located in the neighbourhood and to what extent the schools are visually present. The same sort of map is produced for several schools constructed at different times, making it possible to compare their differences and similarities with respect to visibility. This visual comparison is combined with a calculation of the local exposure rate, which describes the relation between the visibility and the location of the schoolyards. The use of maps on different scales and with different information (visibility and centrality) as visual material has been a driving factor in finding a way to calculate the rate.

Another visual method applied in the lens used here are diagrams. The diagrams visualize spatial information about the schools, but they are not spatial in the same way as the photographs, drawings, and maps. The diagrams

Figure 2. Photographic isovist from a schoolyard to the street, on the left, the eye height of an adult, and, on the right, the eye height of a child. Photographs by the author

are more concerned instead with time as a structuring element. Through bringing time together with spatial information, the diagrams contribute to facilitating a discussion of how societal changes are actually materialized in the everyday architecture of schoolyards. The diagram in figure 5 places the current (2019) size of public primary schoolyards in a timeline of when they were constructed, along with information on what schoolyard sizes the state guidelines recommended at that particular time. This diagram thus combines the historical analyses of the guidelines and regulations with contemporary spatial information on public primary schoolyards in Stockholm. By bringing these pieces of information together in one diagram, the present size of the schoolyards is compared to what the state guidelines recommended and to the sizes of schoolyards constructed under other planning regimes. This overlapping of information opens up the possibility to discuss the extent to which the guidelines impact the built environment, indicating whether other factors, for example, the cost and availability of land, are important in how schools have been designed and planned over time.

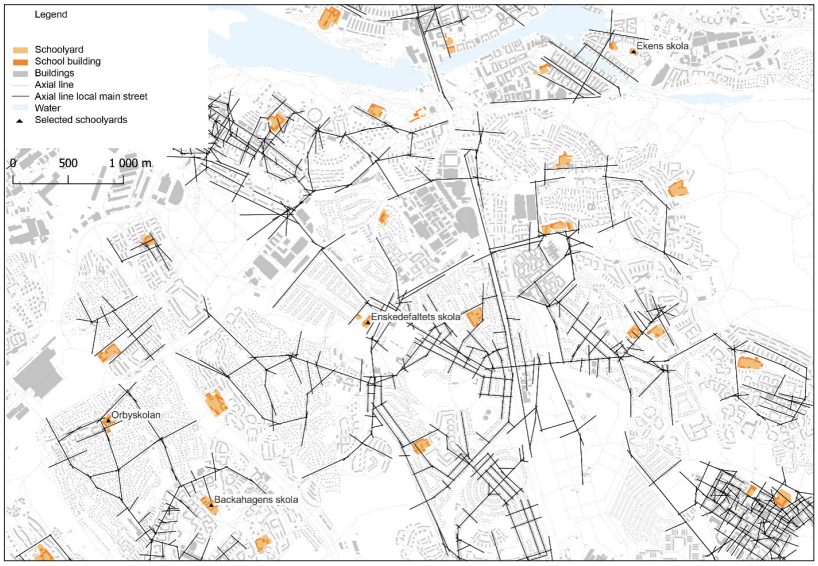

Figure 3. The map shows an analysis based on an axial map of Stockholm, where the map is actually a model of Stockholm, and as a model, is a simplification of the lived environment. The map shows the southern part of Stockholm and the local main streets (integration core R6) highlighted in black and schools in orange. Source: the Author.

The aim of including the visual method in the lens is two-fold. One is to combine findings from the morphological analyses with findings from the historical analyses and to thus generate new questions and findings, where the visual material contributes to an increased understanding and readability of the findings. One example of this is seen in the diagrams in figures 4 and 5, two examples of how the triangulation approach of the lens provides new findings. The second aim of the visual method is to represent the results from the analyses in a clear and readable way, to visualize locations, connections, and visibilities of the schoolyards in the city. This consequently shows both as the results and a representation of them (see, for example, figure 3).

THE NOVELTY OF THE APPROACH

The interest in how societal changes and architecture are interlinked has a long history, and many others have also dealt with this topic. The following section provides some examples of methods used by other researchers. There are similarities and differences between those methods and the lens suggested in this article. Within the field of morphological analyses, or space syntax,

Figure 4. Isovists of a public school in Stockholm. Source: the Author.

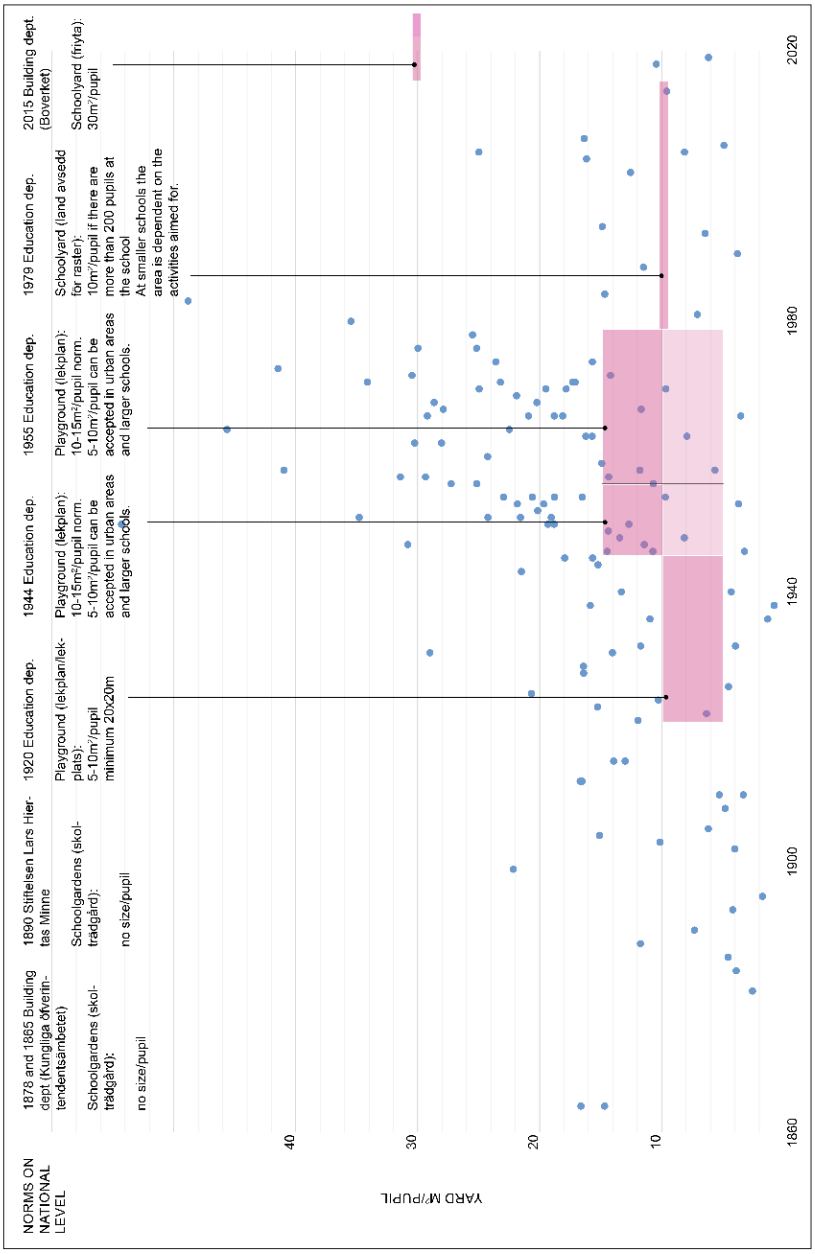

Figure 5. The diagram shows schoolyards (the blue dots), their size in square metres, and year of construction. Superimposed on this are the size recommendations from the guidelines (pink boxes). Source: the Author

several researchers use a combination of spatial and historical analyses. Griffiths categorizes the use of history and space syntax research in four categories. Two of these categories, *syntactical morphological histories* and *spatial-locational histories*, could also be used to describe the morphological and historical analyses in the lens.[24] In both syntactical morphological histories and spatial-locational histories, the focus is on the social and spatial aspects of urban living.[25] Throughout her long career, Hanson has occupied herself with questions regarding urban society, space, and history. To increase the understanding of how society and space are interlinked, Hanson has applied morphological analyses in combination with historical sources and observations of urban life, and represented the results by means of visual material.[26] Psarra, using a method similar to Hanson's, includes planning ideas along with archival material when writing about how Venice has developed over time.[27] Vaughan, also using similar methods, combines morphological analyses, historical sources, and visual material to study the visibility of synagogues in London.[28] The lens used here is based on these methods developed and applied by Hanson, Psarra, and Vaughan. Other research of importance when developing the lens presented in this article are the methods used by Bacharel, Heitor, and Alegre when writing about schools in Lisbon and their changing locations over time, Legeby, Koch, and Miranda Carranza writing about the presence of schools in Gottsunda, and Peponis writing about the pedagogical functions of the city.[29]

One example of research using a combination of methods is that of Markus, who looks at the history of buildings, making spatial analyses of the interiors of the buildings and using historical analyses and visual material to understand how ideas (of power) are materialized in the buildings.[30] This approach might be the one closest to the lens presented here. The biggest difference, however, is that Markus studies interiors, while this research studies the urban environment. Research focussing more on guidelines and regulations in order to understand the built environment includes, for example, Ross writing about how fire regulations impact building design. The methodological difference, however, is that Ross uses science and technology studies (STS) and infrastructural studies as a theoretical framework to study buildings.[31] But the view of the importance of guidelines and regulations in shaping shape architecture is shared. In the Swedish context, Lindholm interrogates the same state architectural guidelines for schools in Sweden as this research. Her dissertation is an important reference to the work of understanding how the state architecture guidelines of schools and school-

yards have changed over time in Sweden, and how this is connected to a changing society with more childcare outside the home and an increasing population. Lindholm also studies present schoolyards (1995) and the activities there in order to find out what makes a good schoolyard.[32] Nilsen and Hägerhäll present a Norwegian perspective on how regulations impact the built environment by researching how the changing space requirements for outdoor play areas of kindergartens in Oslo influence the actual outdoor play areas.[33] The difference between the methods used by Lindholm and by Nilsen and Hägerhäll and the lens is how the analysis of the built environment is approached. While Lindholm uses interviews and site visits to a selection of schoolyards, Nilsen and Hägerhäll employ statistical computations of the outdoor play areas.

Within the field of education history, an overview of the history of Swedish schoolyards as a pedagogic and social environment from the sixteenth century to today is presented by Larsson, Norlin, and Rönnlund. They describe and discuss state architectural guidelines, what was intended with them, and how they were materialized based on a selection of schoolyards.[34] From an international perspective, Burke and Grosvenor give an account of the educational history of school buildings and societal changes.[35] The difference in methods—apart from both methods being situated in the field of history—between the abovementioned education history researchers and the lens used by this author is the use here of morphological analyses and visual research methods.

In summary, the difference between the lens suggested here and the abovementioned research is two-fold. One is the place and time: this research studies the urban environment of schools and schoolyards in Stockholm, Sweden, from the late nineteenth century until today. The other is the use of state architectural guidelines and recommendations, along with the planning ideals presented in the *Swedish Journal of Architecture*, used here as a way to find out what society intended to be the advisable locations and designs for schools. The morphological and syntactical analyses show the structure of the built environment and hence the possible everyday movements and encounters, through which we learn about society. The addition of the guidelines to the analyses, as in the lens, provides an account of the intentions of the state—regarding education, discipline, and play—over time, thus contributing another aspect to the understanding of society and space. Spatial analyses themselves are not commonly applied within historical research.

DISCUSSION

Three methods are discussed in this article, each of them borrowed from different disciplines. In the introduction, transdisciplinarity is defined according to Griffiths and Lünen. A further explanation in line with this by Hirsch Hadorn et al. defines transdisciplinarity 'as a form of research that transcends disciplinary boundaries to address and solve problems related to the life-world'.[36] Even though the approach discussed in this article is used to understand life-world situations, the article itself does not 'transcends disciplinary boundaries'. As this article is written from within the discipline of architecture, borrowing methods from disciplines like urban morphology and urban history, probably no disciplinary boundaries are crossed. This approach to borrowing and combining perspectives from other disciplines is common in architecture—as acknowledged by both Hirsch Hadorn et al. and Doucet and Janssens. Moreover, the discipline of architecture also includes research on urban morphology and architecture history.

Doucet and Janssens understand transdisciplinarity as 'the integration of discipline and profession (theory and practice) in knowledge production, the ethical dimension, and the importance of experimental, *designerly* modes of inquiry'.[37] While the ethical dimension of the research might be found in the interrogation of how schoolyards have changed, it is not ethical in the sense of Doucet and Janssens. The visual research methods are in a way 'designerly' modes of inquiry, however, at the moment, these drawings, maps, diagrams, and photographs have no impact on the actual schoolyards or planning situations, but are instead ways of mapping the past and present. Woiwode and Bina describe how transdisciplinarity research facilitates transformation.[38] In a way, through using the approach discussed in this article—thoroughly mapping how societal changes are materialized in the architecture of our everyday places—knowledge of the city today is collected. This knowledge might inform decisions on how to transform the present situation in order to engender a better the future. The approach is therefore not transdisciplinary in that it borrows methods from three different disciplines, but in that it plays a role in facilitating a transformation of society by presenting knowledge of past and present societal changes.

MORPHOLOGICAL ANALYSES

Parts of the field of space syntax are sometimes criticized for behaviourism, and that may, of course, be true.[39] In the way that space syntax is used as a method within the lens, it analyses the spatial configurations of schools

and the spatial configurations that have an impact on human movement, as shown, for instance, in research by Hillier and Hanson.[40] Having a well-established theory based on empirical studies provides support when investigating and mapping the built environment of schools. However, it is very important not only to study the built environment in its own right, but also to include the perspective of sociocultural processes—since architecture and society are inseparable.[41] An on-going interplay between the morphological and the historical analyses is carried out in order to avoid narrating a story of cause and effect between architecture and society, and instead to emphasize that architecture and society are an assemblage of multiple processes.[42]

The morphological analyses capture what is visible from the schoolyard (in the built environment), what is hidden, or what is easily permeable, thus facilitating an informed discussion of power relations in the city.[43] It is, however, important to keep in mind that these analyses are based on a model, an axial map, which is a 'radical simplification and abstraction of the system of open space' drawn by hand.[44] When drawing this simplification and abstraction, there is a risk of 'the mapmakers' world that is being represented' adhering to current norms and ideals.[45] Even though a model has to be a simplification and abstraction of reality in order for analyses of the complex reality to be performed, the model itself is both a technology of power and also contains ideas of power.[46] At the same time, to be able to map the power relations of the city and trace societal changes in architecture, the model has to include information about power relations.

The morphological analyses capture the spatial relational structure, including power relations and important places. To unpack this over time, historical analyses of documents concerning schools are used. As Griffiths and Vaughan write: 'Urban space is not a timeless backdrop to social action but a relational structure.'[47] Through using morphological analyses as one part of the lens, it is therefore possible to explore this relational structure over time and over the course of changing societal ideals.

HISTORICAL ANALYSES

One of the things in the historical analyses to be critical of is the importance that the guidelines and recommendations are given in relation to the built environment. According to Lindholm and Paget and Åkerblom, for instance, the guidelines from 1979 did not have much influence on the construction of schools, since soon after they were published, big changes were made in

the education department and to the building and planning department.[48] This made the question of the school buildings and schoolyards 'disappear' from their responsibility. Westberg also writes that the guidelines from the late nineteenth century had a lower impact on how schools were then built than, for example, the economy of the parish, access to land, and construction materials.[49] This is confirmed by the results of the analyses as shown in figure 5, which visualizes how the size of the schoolyards is both bigger and smaller than the recommendations in the guidelines. Another aspect excluded from the historical analyses, however important, is positioning the expert authors within their time and social (power) networks. Lundin traces this meticulously, giving his material added richness and depth.[50] In the historical analyses conducted within this research, such a meticulous tracing of the guidelines or the SOUs is not done. They are used as they are, as textual descriptions of ideals of what should be built, how this should be done, and why.

VISUAL RESEARCH METHODS

As representations, the photographs, drawings, maps, and diagrams are 'entangled with power and control'.[51] This makes it of utmost importance to pay attention to how the representations are constructed, to what is included and what is left out of them. The representations have to be made with care, with an awareness of what is made visible and what is left out, and of what agency the representations have and what reality is reproduced through them.[52] Through this awareness, the visual material contributes a critical perspective to the approach of the research project. The same care should also be applied to the morphological and historical analyses so as to strengthen a critical perspective on what sorts of sources and models are included or excluded and how they are selected. The strength of the visual research method is how it visualizes results, combines findings, and through this combination opens up new understandings of the findings, thus facilitating new questions and improving the interpretation of the results.

Through using photographs, drawings, maps, and diagrams as one part of the lens, it is possible to examine the relational aspects between space and potential social interactions and how they have shifted due to changing societal ideals. Other sorts of welfare architecture can be examined with the same lens, as the lens is intended not only for research on schools and schoolyards. Architectures who are part of everyday life, shape society, integrate or segregate urban life, and, in the long run, possibly contribute to spatial

inequality, depending on where they are located and how they are designed. Preschools, playgrounds, parks, libraries, sports facilities, religious buildings, and grocery stores are all examples of welfare architectures that it would be interesting to examine through the same lens. Schools and schoolyards were, however, selected in this research since they play such an important part in shaping society and have a long history. Schools are furthermore an important element in urban design, particularly when planning for neighbourhood community, shaping social bonds, and making encounters between others possible.

CONCLUSION

This article has discussed a lens as a research approach based on three different methods: morphological and historical analyses and visual research methods. I argue that through combining the three methods in the lens, it is possible to find out how societal ideals are materialized in the architecture of schoolyards and to increase the understanding of how changes in society are materialized in everyday architecture. Furthermore, the lens contributes to analyses of the built environment. The changes in society that can be traced in the architecture of schools emerge and become visible when studied through the lens. I argue that these traces are found in where the schools are located in the city, in how the spatial relation between school building, schoolyard, street, and neighbourhood is configured, and in how visible the schoolyard is from the surroundings and how permeable it is. The combination of the three parts of the lens lends the research a richness and is important so as to be able to map the continuous transformations of the built environment in relation to societal changes. There is a constant interplay between the three parts in the lens in order to sharpen the image of how entangled the material reality of lives today is with past architectural and societal events. The changes in the built environment indicate how society has changed and how societal ideals regarding places for children in the city have shifted over time. By using the lens to study schoolyards, an image of society and how architecture is shaped according to specific ideals of spatial possibilities for children is painted. This image, in turn, relates how societal changes are materialized in the architecture of our everyday places.

NOTES

[1] Håkan Forsell, *Urbana Infantil: Stadsmiljö, pedagogik och kunskapssamhälle i metropolernas tidevarv 1900–1930* (Lund: Sekel, 2012), p. 87, translation by the author.

[2] Kim Rasmussen, 'Places for children—Children's places', *Childhood*, 11/2 (2004), https://doi.org/10.1177/0907568204043053 [all URLs here accessed in January 2025].

[3] Forsell, *Urbana Infantil*.

[4] See for example Matilde Kautsky, 'The presence and visibility of schoolyards in Stockholm: Investigating the potentials of a local exposure rate', paper presented at the 14th International Space Syntax Symposium, University of Cyprus, Nicosia, 2024.

[5] Sam Griffiths and Alexander von Lünen, 'Preface', in *Spatial Cultures—Towards a New Social Morphology of Cities Past and Present*, ed. Sam Griffiths and Alexander von Lünen (London: Routledge, 2016), p. xxii.

[6] Thomas A. Markus, *Buildings and Power: Freedom and Control in the Origin of Modern Building Types* (London: Routledge, 1993); Hjördis Kristenson, *Skolhuset—idé och form* (Lund: Signum, 2005).

[7] The other 120 primary schools are independent schools and only partially included in the research project due to diverging regulations.

[8] Maria Bacharel, Teresa Heitor, and Alexandra Alegre, 'School-Place as a Collective Urban Entity: The case study of Lisbon', paper presented at the 11th International Space Syntax Symposium, Instituto Superior Tecnico, Departamento de Engenharia Civil, Arquitetura e Georrecursos, Lisbon, 2017.

[9] Per Lundin, 'Bilsamhället. Ideologi, expertis och regelskapande i efterkrigstidens Sverige', PhD thesis, Royal Institute of Technology, Stockholm, 2008, p. 43.

[10] Sophia Psarra, *Venice Variations—Tracing the Architectural Imagination* (open access PDF: UCL Press, 2018); Sam Griffiths and Laura Vaughan, 'Mapping spatial cultures: contributions of space syntax to research in the urban history of the nineteenth-century city', *Urban History*, 47/3 (2020), https://doi.org/10.1017/S0963926820000206; Sam Griffiths, 'The use of space syntax in historical research: Current practice and future possibilities', paper presented at the 8th International Space Syntax Symposium, Santiago de Chile, 2012; Igea Troiani and Suzanne Ewing, 'Introduction: Visual research methods and "critical visuality"', in *Visual Research Methods in Architecture*, ed. Igea Troiani and Suzanne Ewing (Bristol: Intellect, 2021).

[11] Linda N. Groat and David Wand, *Architectural Research Methods*, 2nd edn. (Hoboken: Wiley, 2013), pp. 81ff.

[12] Psarra, *Venice Variations—Tracing the Architectural Imagination*.

[13] Bill Hillier and Julienne Hanson, *The Social Logic of Space* (Cambridge: Cambridge University Press, 1984).

[14] Ann Legeby, Daniel Koch, and Pablo Miranda Carranza, 'Schools at "Front Row": Public buildings in relation to societal presence and social exclusion', paper presented at the 12th International Space Syntax Symposium, Beijing, 2019.

[15] Griffiths and Lünen, 'Preface'.

[16] Hillier and Hanson, *The Social Logic of Space*.

[17] M L Benedikt, 'To Take Hold of Space: Isovists and Isovist Fields', *Environment and Planning B: Planning and Design*, 6/1 (1979), p. 47, https://doi.org/https://doi.org/10.1068/b060047.

[18] Benedikt, 'To Take Hold of Space', p. 47.

[19] Laura Vaughan, 'The spatial morphology of synagogue visibility as a measure of Jewish acculturation in late nineteenth-century London,' *Urban Morphology*, 24/2 (2020).

[20] 'Tidskriften Arkitektur: Om oss', https://arkitektur.se/om-oss/.

[21] Lundin, 'Bilsamhället. Ideologi, expertis och regelskapande i efterkrigstidens Sverige', pp. 42–43.

[22] Gillian Rose, *Visual Methodologies: An Introduction to Researching with Visual Materials*, 4th edn. (London: Sage, 2016).

[23] Troiani and Ewing, 'Introduction: Visual research methods and "critical visuality"', p. 7.

[24] Griffiths, 'The use of space syntax in historical research'.

[25] Griffiths, 'The use of space syntax in historical research'.

[26] Julienne Hanson, 'Urban transformations: a history of design ideas', *URBAN DESIGN International*, 5/2 (2000), https://doi.org/10.1057/palgrave.udi.9000011; Julienne Hanson, 'Order and structure in urban design: The plans for the rebuilding of London after the Great Fire of 1666', *Ekistics*, 56 (1989), pp. 334–35; Julienne Hanson, *Decoding Homes and Houses* (Cambridge: Cambridge University Press, 2003).

[27] Psarra, *Venice Variations—Tracing the Architectural Imagination*.

[28] Vaughan, 'The spatial morphology of synagogue visibility as a measure of Jewish acculturation in late nineteenth-century London'.

[29] Bacharel et al., 'School-Place as a Collective Urban Entity'; Legeby et al., 'Schools at "Front Row"'; John Peponis, 'On the pedagogical functions of the city: a morphology of adolescence in Athens, 1967–1973', *The Journal of Space Syntax*, 7/2 (2017).

[30] Markus, *Buildings and Power*.

[31] Liam Ross, 'Standard Side Effects: On the accidental architectures of fire-safety legislation', PhD thesis, University of Edinburgh, 2018.

[32] Gunilla Lindholm, 'Skolgården: vuxnas bilder, barnets miljö', PhD thesis, Sveriges lantbruksuniversitet, Alnarp, 1995.

[33] A. H. Nilsen and C. M. Hägerhäll, 'Impact of space requirements on outdoor play areas in public kindergartens', *Nordic Journal of Architectural Research*, 24/2 (2012).

[34] Anna Larsson, Björn Norlin, and Maria Rönnlund, *Den svenska skolgårdens historia: skolans utemiljö som pedagogiskt och socialt rum* (Lund: Nordic Academic Press, 2017).

[35] Catherine Burke and Ian Grosvenor, *School* (London: Reaktion, 2008).

[36] Gertrude Hirsch Hadorn et al., 'The Emergence of Transdiciplinarity as a Form of Research', ed. Gertrude Hirsch Hadorn et al., *Handbook of Transdiciplinarity Research* (Springer Dordrecht, 2007), p. 20.

[37] Isabelle Doucet and Nel Janssens, 'Editorial: Transdisciplinarity, the Hybridisation of Knowledge Production and Space-Related Research', ed. Isabelle Doucet and Nel Janssens, *Trandisciplinary Knowledge Production in Architecture and Urbanism—Towards Hybrid Modes of Inquiry*, *Urban and Landscape Perspectives*, 11 (Dordrecht: Springer, 2011), p. 2.

[38] Christop Woiwode and Olivia Bina, 'Transdisciplinarity Revisited: Transformative Potential of Lessons We Might Learn', in *Enabling the City—Interdisciplinary and Transdisciplinary Encounters in Research and Practice*, ed. Josefine Fokdal et al. (New York: Routledge, 2021).

[39] Sara Westin, 'Planerat, alltför planerat: En perspektivistisk studie i stadsplaneringens paradoxer', PhD thesis, Kulturgeografiska institutionen, Uppsala University, 2010, http://urn.kb.se/resolve?urn=urn:nbn:se:uu:diva-132474.

[40] Hillier and Hanson, *The Social Logic of Space*.

[41] Westin, 'Planerat, alltför planerat'; Griffiths and Lünen, 'Preface'.

[42] Albena Yaneva, *Mapping Controversies in Architecture* (Surrey, England: Ashgate, 2012); Westin, 'Planerat, alltför planerat'.

[43] Daniel Koch, Ann Legeby, and Pablo Miranda Carranza, 'Suburbs and Power: Configuration, Direct and Symbolic Presence, Absence, and Power in the Swedish Suburb Gottsunda', paper presented at the 12th Space Syntax Symposium, Beijing, 2019.

[44] Griffiths and Vaughan, 'Mapping spatial cultures', p. 505.

[45] Griffiths and Vaughan, 'Mapping spatial cultures', p. 504.

[46] Troiani and Ewing, 'Introduction: Visual research methods and "critical visuality"'; Doreen B. Massey, *For Space* (London: Sage, 2005).

[47] Griffiths and Vaughan, 'Mapping spatial cultures', pp. 499–500.

[48] Lindholm, 'Skolgården: vuxnas bilder, barnets miljö'; Susan Paget and Petter Åkerblom, 'Från rastyta till pedagogiskt rum', in *Korban, Majjen och Nallen*, ed. Staffan Selander (Stockholm: Myndigheten för skolutveckling, 2003).

[49] Johannes Westberg, *Att bygga ett skolväsende: Folkskolans förutsättningar och framväxt 1840–1900* (Lund: Nordic Academic Press, 2014).

[50] Lundin, 'Bilsamhället. Ideologi, expertis och regelskapande i efterkrigstidens Sverige'.

[51] Troiani and Ewing, 'Introduction: Visual research methods and "critical visuality"', p. 9.

[52] Troiani and Ewing, 'Introduction'; Rose, *Visual Methodologies*.

THE EMERGENCE OF LEARNING SPACES THROUGH TEACHING PRACTICES

Siv Marit Stavem

ABSTRACT

Many new schools are built every year. A variety of architecture and design can be observed, and teachers can expect to work within differently designed learning spaces over the course of their careers. Through a sociomaterial lens, this article reports on three classrooms in three different cities in Norway to show how the learning spaces came into being through teaching practices. Drawing on observational and interview data, the article focusses on the interplay and interrelation of people and things within teaching processes, with a particular emphasis on aspects relating to classroom windows and breakout spaces. The findings show that people and things both adapted and were adapted in the translations in the classrooms. The data also reveals challenges connected to the lack of local anchoring for the design of school buildings as well as how people often inhabit such buildings in ways that were not planned for. The article concludes by suggesting that learning spaces are as much a product of social construction as of technical innovations and devices in the built environment.

KEYWORDS

school design, learning spaces, translation, sociomateriality

INTRODUCTION

School buildings the world over have countless designs resulting from collaborations amongst experts in many disciplines. Schools also exist in buildings that were not originally intended for this specific purpose. The main objective of this article was thus to explore how learning spaces emerge within differently designed built environments and within networks of actors, such as teachers and students, as well as nonhuman actors, such as walls, windows, chairs, and tables, with particular attention given to windows and breakout spaces. This article brings educational and architectural research together in a transdisciplinary study. Its importance is found in the fact that the design and making of classrooms are silent and invisible parts of teaching that are often taken for granted.[1]

One assumption in this article is that physical learning environments change continuously over time, as 'schools and classrooms . . . are not static points, but whole series of events and social relations over time'.[2] Another assumption is that teaching is a situated activity. As classrooms or equivalent spaces are where students spend most of their time during the school day, this article focusses on such spaces.

Of particular importance is Larry Cuban's proposal that teaching is shaped by 'the way a school space is physically arranged; how content and students are organized into grade levels; how time is allocated to tasks; and how rules govern the behaviour and performance of both adults and students'.[3] Here, Cuban emphasizes how teachers adapt and adjust their teaching to the corresponding education policy regulations and to materialities in the classroom. This article adds to these notions by asserting that teaching is not merely a result of how teachers adapt to the different surrounding elements; instead, teachers are actors in various interconnecting networks of people and things, and both adapt and are adapted through teaching practices.

Space was once an invisible field in the social sciences. Sociologist Anthony Giddens noted that 'neither time nor spaces have been incorporated into the centre of social theory, they are ordinarily treated more as "environments" in which social contact is enacted . . . rather than [as] integral to its occurrence'.[4] In most research, the school building, with its spaces, is addressed as though it was a neutral stage or setting for conducting teaching and learning. However, recent decades have witnessed a shift within scholarly research that is often referred to as 'the spatial shift'. Once taken for granted, the physical learning

environment is now included in a growing research field that is '. . . gaining increasing attention with associated notions of "innovation", "21st-century learning" and the perceived need to address outmoded industrial modes of schooling'.[5]

The sociomaterial perspective provides a framework for describing the process of how learning spaces emerge during teaching practice not through dichotomies but rather through networks and relationships.[6] Using concepts from the actor-network theory as adopted in this article, it was assumed that learning spaces are as much a product of social construction as they are of materialities such as technical innovations and devices in the built environment. As such, this article focusses on how learning spaces emerge through the teaching process and interrelations between actors via translations and negotiations and addresses the following research questions.

- RQ1: How are actors assembled for teaching practices in the classrooms in renewed school buildings?
- RQ2: What possible learning spaces emerge through the interrelations between the actors in the network?

To answer these questions, the article looks in particular at classroom windows and breakout spaces. It draws on observations and interview data from three schools in three municipalities in Norway. The country features a centrally governed curriculum; but the design and quality of school buildings result from the decisions of local governments.[7] While simple comparisons arose during the discussion of the three cases, this study functions as an analysis of multiple cases to shed light on how networks or webs of learning spaces unfold during teaching based on three specific local cases. Accordingly, it explores how physical learning environments emerge through the interrelations of different building designs, the agency of teachers, and other actors.

The first section introduces research perspectives on the design of physical learning environments. The methodologies used in collecting the data for this study are then outlined, and how these techniques are suited to the scope of this article is discussed. This is followed by a presentation and analysis of the findings, which are exemplary of wider practice. By focussing on breakout spaces and windows, the article explores how architecture and pedagogy become entangled in the making of learning spaces. Finally, by disentangling

the interrelationships and connections between actors, the article discusses how different actors both adapt and are adapted to other actors in the network of the learning spaces and considers the role of translations between actors within this web.

PERSPECTIVES ON PEDAGOGY AND ARCHITECTURE IN RESEARCH ON SCHOOL DESIGN

Previous studies of school design emphasized that spaces should be regarded as the products of social, physical, and material aspects in interaction.[8] This article, however, explores learning spaces as emerging effects of the relationships between actors in the teaching process. Learning spaces are thereby transformed, produced, and developed, since readymade models of classrooms do not fit into new contexts of education.[9] Recent studies have looked at life inside schools and indicated that in their teaching practices, teachers adapt to and are happy with the usefulness of the school design, regardless of whether the school consists of traditional classrooms or open learning spaces.[10] Other studies have, however, found that teachers do not adapt and are unhappy when a school is renovated to offer a more open design rather than classrooms.[11] It has thus been suggested that the relationship between design and practice is crucial to the production of a building that can be used effectively.[12] Torin Monahan introduced the concept of 'built pedagogy', which can be regarded as the architectural embodiment of educational philosophy, to account for 'the ways that built environments teach values through their constraints upon social action and interaction'.[13]

By taking a historical perspective when examining an open-plan school built in Denmark in the 1960s, Lisa Rosen Rasmussen showed how architecture and pedagogy become entangled when teachers and students inhabit and used a new school building, and how teachers' spatial work processes are situated in time materially and discursively.[14] When analysing the working classroom with respect to how the material structure (for instance, spaces, walls, furniture, and tools) and the working procedures, artefacts, and knowledge systems were integrated, Martin Lawn pictured the classroom as consisting of software and hardware. The hardware comprises the material structure—spaces, walls, furniture, and tools—and the software consists of working procedures, that is, a series of ideas and knowledge systems operating within the material structure.[15] He further raised the question: 'If a classroom was designed with built-in values and purposes, which shape the work and behaviour of the teacher, then what were those ideas and how were they

turned into machined solutions?'[16] With regard to software, previous studies have concerned themselves with the ongoing need to support school leaders and teachers when they enter new learning environments.[17] These needs were also pointed out in a study of Icelandic teachers and school leaders indicating that teachers and school leaders could be trained in environmental awareness, here understood as the competence to use the opportunities offered by the physical learning environment, on an on-going basis.[18] In terms of hardware, the classrooms examined for this article were designed differently but based on the same values and intended purposes.

In her study of digital classrooms, Ines Dussel describes the classroom as a group of students who learn similar things at the same time and who pay attention to a teacher, who has a central programme that structures teaching.[19] A longstanding critique of traditional school routines has been that organizational structures and systems for the purposes of social governance constitute rituals [20] and forms of manipulation[21] and control activities that seek to form obedient individuals.[22] As Jan Nespor has noted: 'The temporal organization of something like a classroom isn't entirely given by the physical and calendars but is also produced by the ways in which teachers and students organize their work and referential practices in terms of alternate spatial and temporal orders.'[23] This corresponds well with the words of Tara Fenwick, who has argued that everyday educational practice 'is constituted through entangled social and material forces that continually assemble and reassemble'.[24]

Thus, as built policy, physical learning environments can be vehicles for values and ideas, but they are also strongly connected with the people who inhabit them and the practice of the actors. Against this backdrop, this article empirically explores how learning spaces come into being through the practice and routines involved in teaching, which are analysed through the theoretical lens of sociomaterial thinking.

CONCEPTUAL FRAMEWORK: TRANSLATIONS, PLUG-INS AND ARTICULATION

By applying the elements of actor-network theory (ANT), this article explores how learning spaces can be regarded as emerging effects of social processes and interrelations between actors and actor networks. Walls, furniture, students, books, and teachers are not fixed categories with specific characteristics, but are instead explored as effects of heterogeneous relationships—

that is, of network effects. The article consequently draws on the concepts of translations, plug-ins, and articulators when analysing the findings, as these were useful in exploring how the interrelations of people and things produce learning spaces.

Michel Callon has referred to ANT as a sociology of translation.[25] 'Translation' can be understood as describing what happens when people and things come together and connect. The connections of actions and things form chains or networks that tend to be stable and durable.[26] The connecting entities change or translate each other to become part of a network. The entities themselves can be networks consisting of chains of connections between actors who have settled into routines and can be taken for granted. It is important to note that translations are not deterministic, as the agencies of the entities are unpredictable; thus, translations can be 'incremental or delayed. Or they may be partial, producing weak connections or even disconnections.'[27]

Plug-ins are the competencies needed to make meaning and to make translations happen; hence, to be a fully competent actor, plug-ins are needed. Bruno Latour used the metaphor of plug-ins to describe this mental equipment after suggesting synonyms such as 'subjectifiers, personalizers or individualizers'.[28] When two actors meet, there is not necessarily a connection made or translations formed. For such a translation to happen, the right plug-ins are needed. What Latour called 'articulation' is the transported presence of one place into another. For Latour, nonhuman entities such as windows, desks, and chairs are not by definition either mute or capable of speech, and they are neither dumb nor smart. Rather, they are articulated better or worse in a particular setting.[29] According to Latour, there are therefore two stages at play in making things speak. The first stage involves things generating a problem that leads the humans around them to speak to each other. The second stage occurs when the things respond to humans, given that the right questions are asked. In this context, a school building is planned for generic teachers and students and a specific content; it can, however, act and behave in new ways. This understanding implies that architectural structures do not determine specific actions but are planned for particular content. Thus, the conceptual framework in this study considered that some actors, such as walls and windows, 'speak', despite not moving or having human voices.

As a member of the family of post-humanist approaches, ANT blurs the distinction between humans and nonhumans and views actors as effects of

relationships and networks in a world that is constantly changing.[30] Buildings are not static objects but are moving from the day they are constructed—in transformations, modifications, renovations, and adjustments in their inhabitants' activities and processes,[31] and the flat ontology implies that the teachers' choices are not connected to free will but are considered the effects of actor networks. ANT posits that ideas, practices, and 'facts' are effects of heterogeneous webs of interrelations between actors, or 'assemblages'.[32]

The following section outlines the methodological steps in this study in order to present how the data were collected and how the analysis was designed to account for the relationships and interrelations between the actors in the network of learning spaces.

METHODS

The aim of this study was to explore how learning spaces emerge during teaching practices as examined in classrooms in three schools. The three schools that comprise the cases examined in this study are public schools, which is appropriate, as only 4 per cent of Norwegian students attend private schools with or without governmental support. The data were collected during April and May 2023; the interviews, however, extended the time period covered by the data, contributing both historical and future perspectives. One municipal school each in Oslo, Bergen, and Trondheim in Norway was selected based on the recommendations of the three local governments. To anonymize the schools, this article refers to them as the Oslo, Bergen, and Trondheim schools. The three schools sampled were all constructed based on locally standardized architectural design briefs, with differences with respect to floor space and openness. One criterion for selection for this study was that the school building must have been completed within the last five years and have replaced an old building or been built as an annex to an older school building. The underlying assumption was that fulfilling these requirements indicated a heightened focus on the physical learning environments and created an opportunity to identify possible breaks in the continuity of the relationships between people and things.

The classroom is a concept with a long tradition; it denotes the primary location used by a group of students during a school day. However, using the classroom concept in describing learning spaces can exclude schools built without classrooms,[33] as was the case for this article, in which schools with open and flexible spaces were central. This article thus focusses on classrooms

and adjacent or equivalent spaces. The scope of this research was purposely narrowed to the third and fourth grades of the schools studied, as teaching and learning for grades five through ten relies more on specialized rooms, such as science labs and art rooms. Moreover, as the variations between classrooms within a school can be considerable,[34] the spaces selected were not considered representative of the school or the classroom. Accordingly, this study does not compare the three cases. Multiple single-case studies are included in most research efforts, and because ideas and evidence may be linked in many different ways,[35] three classrooms or equivalent spaces with different design features were selected, not in order to compare them but rather to provide a broad picture of the physical learning environments. Since the findings from a small-scale qualitative case study like this one are not generalizable, the value of this study instead consists of theoretical and analytical reflections on the interrelations between the human and nonhuman actors in the teaching practices occurring within the three newly built and differently designed classrooms.

One day was spent in each school in order to conduct observations in the relevant learning spaces and to interview two teachers. Combining nonparticipant direct observation and research interviews resulted in the construction of a broad database. The interviews provided an opportunity to verify the interpretations of what was observed and to add to the data from the limited timeframe of the direct observations. Before conducting the observations, the weekly teaching plans were reviewed and, based on them, an observation day was scheduled with both station work and other unspecified teaching sessions. The weekly plans were rather general in that they showed the time structure of the days as well as bullet points about the topics to be covered and information for parents.

The floor plans for the buildings were used in the observation processes and the teachers' movement patterns during a teaching session were documented via simple drawings on the floor plans. The observation protocol also included documentation of the type, positioning, and use of furniture in the spaces, the use of walls for showing different kinds of material, and the placement of windows and glazed walls. Findings from the observations, such as how the teachers moved between students' desks or how a bookshelf covered a window or a glazed wall, were used as starting points for the interviews.

The teachers at the schools are organized in collaborative teams, and the original intention was to conduct group interviews with the teams of teachers. However, at two of the schools, incidents that occurred on the observation day made it impossible for the teachers to gather at the same time. The interviews at those schools were thus conducted individually. The interviews assisted in broadening the scope of the study to include actors that were part of the assemblage but not necessarily visible. The interviews were conducted in the classroom areas as a setting relevant to the purpose of the interview, with the intent of triggering appropriate memories, thoughts, and emotions about the topic of the interview,[36] because what people say relates to where they say it.

The 'hearing interview' is a technique that was developed to enable interviewers to gather relational data on an ontologically flat level[37] and to encourage the interview partners to reflect on their practice. When applying this technique, conducting the interviews shortly after the observed practice was advantageous. The informants were asked short and direct questions about things, practices, and elements from the observations, which required them to describe how, when, and with whom these aspects appeared in their teaching and what happened when they did. They were also asked to think back on the last time they used a certain thing or element in their teaching and whether they could recall other moments and other actors involving this element in their teaching processes. The nature of the hearing interviews made it possible to adjust the questions to the specific situations and observations. The group interview allowed for discussions between the teachers, which could serve to enrich the data, although it came with the risk that group dynamics could potentially silence some participants. All the interview partners were thus offered the opportunity to add information by email.

Every artefact can be seen as an actor network or assemblage connected to several networks that might not be obvious to every other actor. With this in mind, the analysis of the learning spaces drew on object interviews with the heuristic of 'listening for the invitational quality of things'[38] as a guiding principle. The object interviews sought to provide a better understanding of how the nonhuman actors in the learning spaces, in relation to the other actors, 'inform, but also deform, conform or transform practice'.[39] 'Interviewing' the windows and the breakout spaces thus enabled questions to be asked, such as:

'How do the actors relate to each other during practice interactions? Which actors are crucial for practice to occur? If something breaks or disappears, what happens to the interrelations and the practice?'

By drawing on the data from the hearing interviews, object interviews, and observations, this article describes the interrelations between the teachers, the built environments, and the other actors that facilitated the voices of the learning spaces. While on site, the hearing interviews were recorded, and field notes were written. Each interview was subsequently transcribed as part of a close reading of the data. Open coding was employed in repeated readings of the transcribed interviews in order to identify and isolate words and phrases crucial to the emergence of key patterns. Patterns in the open coding were converted into plausible overarching concepts for closed coding. By linking the codes and subcodes, narratives about the translations between the teachers and the other actors were then produced.

The following section details the examination of two aspects that connect the empirical material from the interviews and the observations of the teaching processes in the three classrooms and adjacent spaces. These aspects concerned the windows and views in addition to the breakout spaces, adjacent spaces, and spatial connections. In the presentation of the analysis, these aspects each point in their own way to how the learning spaces emerged through the teaching process. It might also have been interesting to examine other elements such as the furniture and digital materialities, thus changing the direction of the analysis. That is, the choice of elements on which to focus coloured the presentation of the observations and the subsequent analysis.

INTRODUCING THE CASES: THREE SETTINGS FOR TEACHING

Apart from general regulations related to the need for school libraries and overall design, the central educational authorities in Norway have established no regulations or guidelines for how design and functionality should be interconnected. Local governments must thus translate the purpose of the Education Act into design considerations, which leads to a diversity of school design in Norway, spanning from open and flexible learning environments to traditional classrooms and corridors. The largest cities have developed design standards that are considered mandatory for new school buildings and also serve as guidelines for renovation projects. The three schools in this article were all built following local design standards.

The Oslo school, located on the outskirts of the city, was built for 120 students per grade in grades one through seven. The school was a renovation project, with a new extension added to increase the total capacity. Based on the drawings provided, it is clear that both the original school and the new additions were structured as corridors and classrooms with various adjacent breakout spaces. All the classrooms are located on the first floor; the students walk one floor down to enter the cloakroom and the outdoor area. Classrooms are 60 m^2 in size and built to accommodate a maximum of thirty students and one teacher. At the time of the observations, only seventeen students were part of the class. Two classrooms shared a breakout space, a smaller room situated between the two classrooms. A classroom and the breakout room together hence formed an L-shaped classroom.[40] The breakout room had three doors: one to each classroom and one to the corridor. Along the corridor, there were also two playfully designed breakout spaces for groups of three to four students. Additionally, a variety of shared breakout spaces and the school library were located farther down the corridor.

The Bergen school was built for thirty-six students per grade in grades one through seven but had fewer students than the maximum capacity when observed. There were twenty-five students in the classroom during the observation. Parts of the school were temporarily hosting middle school students (grades eight through ten). The school was built with open and flexible learning spaces consisting of clusters of rooms of different sizes. Each grade had exclusive use of one central room of approximately 90 m^2 in size and two breakout rooms with doors and windows to the central room. In one corner was an opening to an emergency escape exit. Some adjacent breakout spaces were shared with another class from a different grade. These shared spaces consisted of a common area with an amphitheatre for approximately twenty students as well as a corridor and three bathrooms, one of which was a bathroom accessible for individuals with disabilities. The cloakrooms and school library were on different floors.

The Trondheim school was built for 100 students per grade for grades one through seven, with clusters of four classrooms for each grade. The clusters were situated around an adjacent and shared breakout space, and the students were split into groups with names associated with colours. The classrooms were connected in pairs, with a sliding door between them. The school had fewer students than the maximum capacity at the time of observation, and

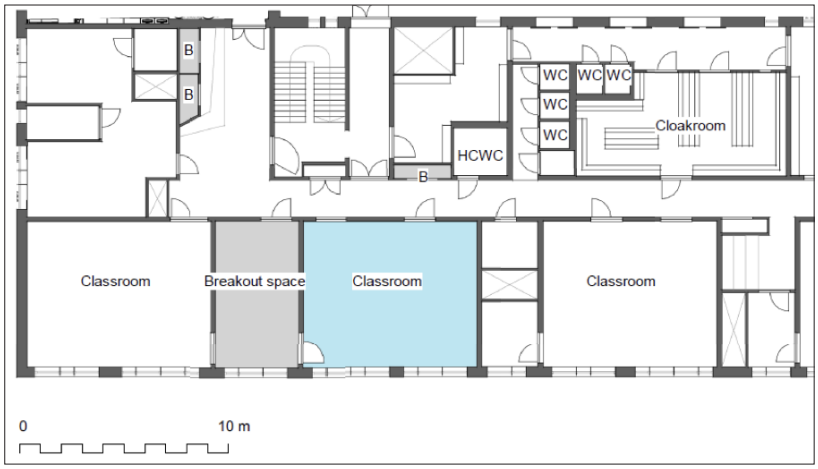

Figure 1. Excerpt of a simplified floor plan for the Oslo school. The classroom studied is marked in blue, and relevant breakout spaces in grey. Small breakout spaces are marked with the letter B. Source: The author.

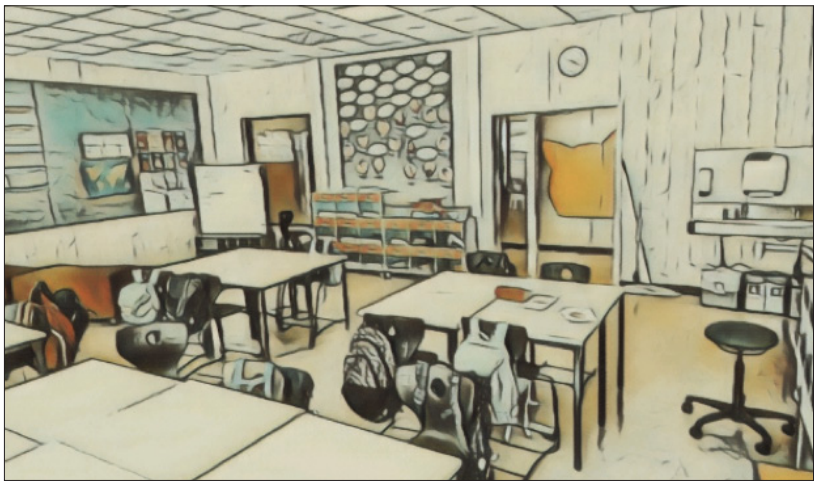

Figure 2. The Oslo classroom. In the left corner is a small whiteboard in front of a window to the corridor. It is partly covered with students' work as decorations. Another window is located next to the door. Through the doorway, a yellow breakout space is visible. Source: The author.

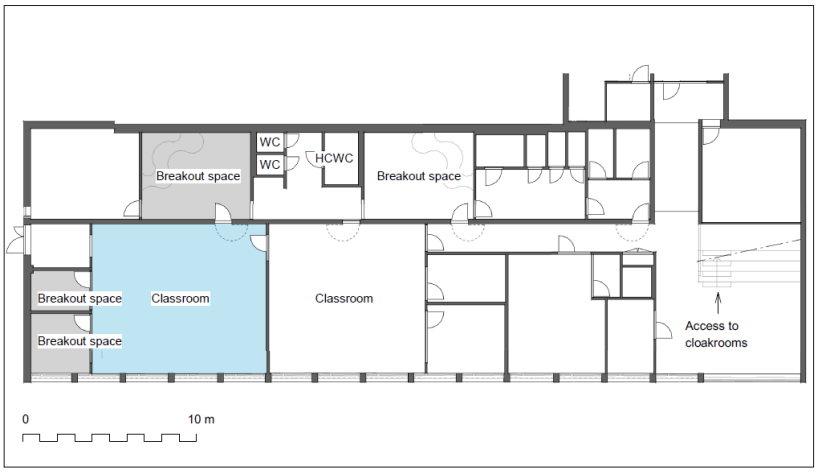

Figure 3. Excerpt of a simplified floor plan for the Bergen school. The classroom studied is marked in blue, and relevant breakout spaces in grey. Source: The author.

Figure 4. The Bergen classroom. Windows to the outside are to the left, and two breakout rooms with doors and windows can be seen in the centre of the picture. An opening to an emergency escape door is in the right corner. Source: The author.

parts of the school were temporarily hosting middle school students (grades eight through ten). During the observation, there were seventeen students in the classroom. Each classroom had 61 m^2 of floor space. The adjacent breakout spaces were shared with other classes and different grades. They consisted of small rooms with doors to the common area, as well as some open spaces partly filled with the lockers that serve as the students' cloakrooms. One wall featured windows with a view of the hills and the sea.

The teachers at the three schools did not have timetables divided into subjects but were instead free to plan their teaching based on topics within the regulations provided by the national curriculum. This was interesting, as Mittermeier and Benade have explored how innovative time allocation and timetable organization can benefit students' learning, and noted that 'predictable routines can either succeed in oppressing or supporting those within them and design is foundational to this'.[41] All three schools practiced station work as a central teaching method for more than one full day each week. The stations were organized with timeframes of approximately ten minutes per station, and alarm clocks were used to signal to the students that it was time to change stations. During the observations of the teaching process, the visible actors that were part of the physical learning environments were examined as well as how the visible actors related to each other. Subsequent interviews with the teachers provided elaborations and more information about what had been observed.

FINDINGS: ACTORS AND THEIR INTERRELATIONS DURING TEACHING PRACTICE

In the following two sections, the findings concerning the actors and their interrelations during the teaching practices are presented. The first section of findings has a particular focus on the breakout spaces and is followed by the section of findings with a particular focus on the windows.

The Breakout Spaces During the Teaching Practices

At the Bergen school, the breakout spaces with doors directly to the classroom were used with the doors open as extension areas to the classroom. The small space that led to the emergency exit had limitations in terms of furnishings but was used by the students as a quiet space for reading and writing. Adjacent to the classroom area in Bergen were three bathrooms, one of which was a disabled-accessible toilet with a larger space. The teachers explained that in the previous week, the students had learned about measuring volumes, and that the low, wide sink in the accessible toilet was excellent

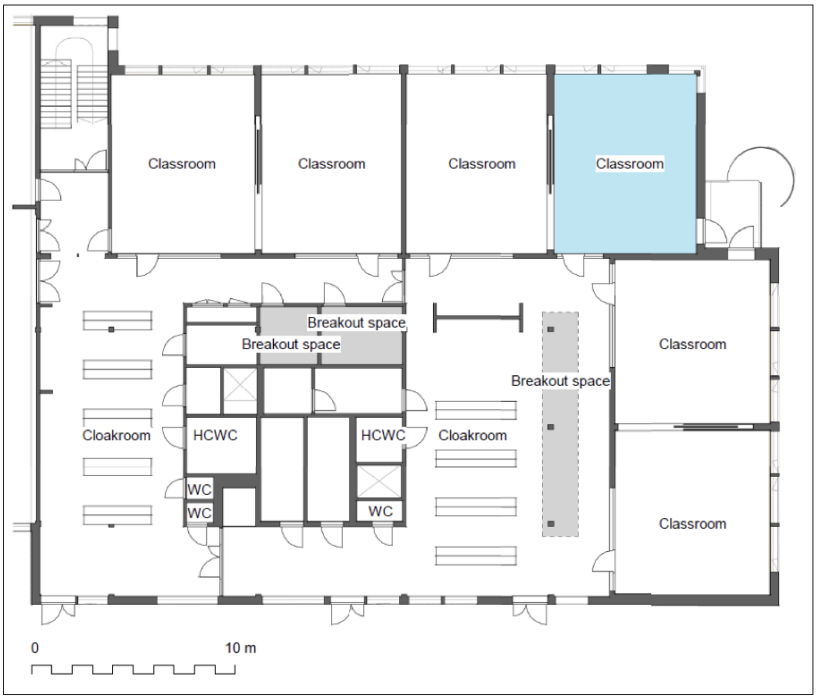

Figure 5. Excerpt of a simplified floor plan of the Trondheim school. The classroom studied is marked in blue, and relevant breakout spaces in grey. Source: The author.

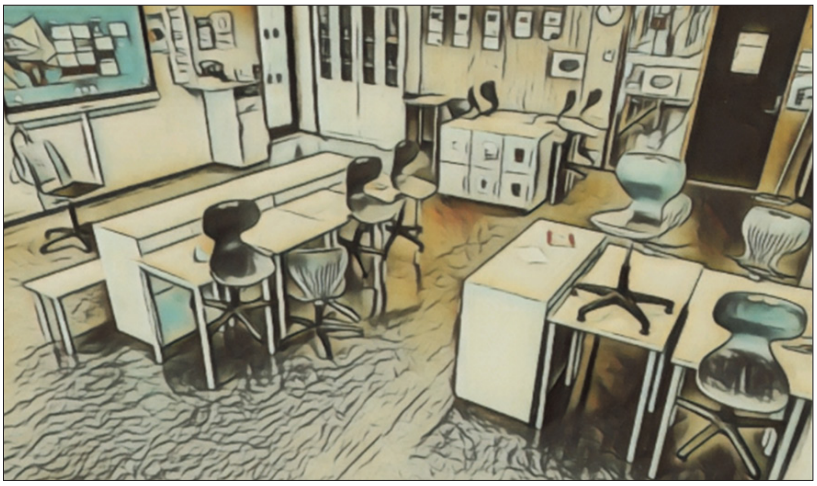

Figure 6. A Trondheim classroom. The window to the left of the door was partly covered with a poster. A window to the outside was in the corner, in the middle of the picture. Source: The author.

for a group of students to measure water. Previously, the students had also chosen the accessible toilet as a useful place to make voice recordings because the acoustics were different than in the other rooms. This showed how the accessible toilet served as a breakout space in station teaching because it was big enough for a group of students and because it had specific qualities that were appreciated. As Latour pointed out, walls, furniture, technology, and other familiar sights in a school building can be said to be vehicles of generic content.[42] The students and teachers at the Bergen school understood the generic content, but they also added to the content in the case of both the accessible bathroom and the space at the emergency exit. By adapting these spaces through interactions, translations, and interrelations between the teachers, students, and other actors, the accessible bathroom and the space at the emergency exit became actors in the local teaching process.

The teacher who was observed in Oslo started the day with the students in the cloakroom and gave them information about the observation before leading the students quietly through the hallway and into the classroom. Similarly, the students were led down the hallway when they were going outside for a break and when they were going home at the end of the day. During the day of the observation, several students asked the teacher for permission to go to the bathroom. The teacher commented that she would never refuse such a request, but they had to ask before going as it was a way of maintaining control of the students: 'Imagine if I lost a student!' (Teacher, Oslo school). When the students returned from the bathroom, they had to knock on the window next to the door to be let in by the teacher or a fellow student as the door to the classroom had a snap lock.

Latour explored how artefacts can replace, shape, and limit human actions and referred to this as the 'missing masses' in society. To understand how society works, we must understand the role of technologies.[43] In the setting studied, the snap lock served as the gate to the adjacent spaces and limited how the spaces were used. Across the corridor, there were playfully designed breakout spaces for small groups of students. The teacher commented that these spaces were occasionally used for reading, but these spaces were not in use during the day of the observation.

At the Trondheim school, the breakout spaces were shared with other classes, and they were used very little for teaching purposes. The teachers commented that the open areas outside the classroom were close to the corridor and

cloakroom, which made them difficult to use. Separate breakout rooms with doors were located 15 to 20 metres down the corridor and thus too far away to send the students there on their own; they also did not have enough teachers to accompany a group of four to five students on their way there. As such, the breakout spaces were not used in the teaching process and were thus not included as actors in the network of learning spaces.

Letting the token drop is also a part of translation, and thus, in the words of Bruno Latour: 'When no one is there to take up the statement or the token, then it simply stops.'[44] By this we understand that if a person or a thing is not acting with the other actors, it is not part of the network. This illustrates that the design of the building, including elements such as the distances between the spaces, is essential for the emergence of learning spaces in the teaching process. Gislason, who introduced a framework for school design research, similarly asserted that organization is a core component of the school environment, and becomes even more decisive in innovative learning environments in which emphasis is placed on schools having a coherent organizational structure that can sustain new and unconventional practices so as to successfully introduce new learning and teaching methods.[45] There were generous adjacent spaces to the Trondheim classroom, but these spaces were not used during the day of observation. The teachers commented that the breakout rooms were too far away, which made them impossible to use unless a teacher joined the students, which was not practical. There were also open breakout spaces outside the classroom, but, according to the teachers, they were also used very little because the spaces led classes to descend into chaos: 'It went well for a while, and then we slipped a bit back to what I said, about the layout, that it invites chaos activities, and it didn't go very well, but we did test it' (Teacher, Trondheim school). In the following section, the findings linked to the windows on the external and internal walls are presented.

Windows and Views During Teaching Practice

Most of the Bergen school day consisted of plenary sessions, during which the teacher actively used the smartboard. While the teacher was reading a couple of poems to the students and talking about the meaning of the poems, an odour was detected, and the teacher opened a window. The seat used during the observations in Bergen was at the back of the classroom, and, when the window was open, it was too noisy to hear anything of the reading. Though there was not much traffic on the road, the sound was thrown between the concrete buildings and made a loud noise. When this was

mentioned to the teacher during the interview, he said that he could not hear anything above the noise either and that the fact that they could not keep a window open to get fresh air because of the noise was a recurring problem. The architect responsible for the school building thus appeared as a silent actor in the design of the walls and the spaces between them. The architect's voice, however, became louder and clearer when elements in the architecture, such as the windows to the noisy road in Bergen, produced obstacles for the teaching and learning in the classroom, and the teacher commented on how the road was not taken into account when 'they' planned and designed the new school building. Thus, while the window could be opened, but, during lessons, it was too noisy to have it open.

In this way, the articulation of the window was obvious for the teacher: It could be kept open or shut. However, when the teachers and students started using it, a problem occurred, as the noise from the outside appeared as a local and situated interaction and entered the learning space, thereby drowning out the interactions of the students and teachers. The Bergen school also has classrooms that face northwards, which should result in little or no glare from the sun. No blinds were therefore provided for the windows. The bright white colour of the neighbouring building, however, reflects the sunlight, so the school has mounted roller blinds on the inside, which are kept closed on sunny days. During the observation, the glare made it difficult to read what was written on the digital screens and on the students' digital devices, which were in use during large portions of the school day. In effect, what is designated by the term 'local interaction' is an assemblage that includes all of the other local interactions distributed elsewhere in time and space, which are brought to bear on the scene through the relays of various nonhuman actors.[46]

In the Bergen school, there are two breakout rooms for four to five people, which are connected to the classroom via a glazed door. A third breakout space is a separate room with a small amphitheatre for approximately twenty-five students. When speaking about the windows from the classroom to the walking area, breakout rooms, or other classrooms, the teachers interviewed commented on the dilemma the windows presented in keeping the students under control without introducing disturbances. To solve this dilemma, the Bergen teachers hung notes on the glass to partially prevent students from seeing through the glass between the classrooms and commented in the

interview that they had never experienced disturbances as much of a problem.

The Oslo school has windows between the classrooms and the corridors. One wall of the classroom consists of windows with a view of the schoolyard and surrounding green spaces. Between the classroom and the corridor there are also two windows, one big and one small. Both teachers at the Oslo school welcomed the windows to the corridor as well as to the breakout spaces and embraced the social interactions they provided: 'It is not disturbing with the window. It is just nice to see that things happen on the other side—that we are not completely locked in, so to say' (Teacher, Oslo school). During the station work at Oslo school, one group of students was in the breakout room, and the teacher hushed the students when they were becoming too loud because the learning activity with a robot was playful. The students asked if they could shut the door to lessen their noise, but the teacher said it had to stay open. About this exchange, the teacher commented that they normally kept the door open when students used the breakout spaces on their own; she, however, stressed the advantage of being able to shut the door in teaching situations when a teacher joined the students in the breakout room.

During the school day, the blinds went down, although the window faced a hill without much direct sunlight. One of the teachers at the Oslo school commented that the blinds would go down automatically, even when there was little sun, but would not always automatically go up again. Manual control buttons resolved this problem in most cases: 'But it doesn't always go down either. It's just as if it suddenly finds out that now I'm going to go down, but when the sun is directly on those sitting there, it doesn't go down. So, it's convenient to have those buttons so I can control it manually' (Teacher, Oslo school). At the Trondheim school, there were windows between the classroom and the corridor with breakout spaces. The windows provide a good overview between the spaces. But when using the building, the teachers were unhappy because the windows that were positioned there by the architects and the planners did not meet the teachers' needs or expectations. The local government planners did not allow the teachers to cover the windows as a solution to the problem of students being disturbed by activities on the other side. During the group interview, the teachers at the Trondheim school reflected that they were happy to have a good overview from the classroom to the breakout spaces. However, the ability of some of the students to

concentrate was disturbed when someone passed by the window between the classroom and the corridor. The window was positioned there by the architect and planners from the local government, who designed this classroom setup for use by many different teachers and students and for different sorts of activities. The architect and the planners could not know exactly which teachers and students would spend time in the building and thus had to plan for generic teachers and students and to predetermine what the users might or might not do and have access to during a school day. While discussing this topic, one teacher commented: 'Then we have to practice that more' (Teacher, Trondheim school). According to the teacher, through practice and repetition, the students and teachers were able to gain competence or the right plug-ins to allow for translations between the architecture and the teachers and students—that is, between the human and nonhuman actors.

When applying the ANT elements of translation, articulation, and plug-ins to the making of learning spaces, it should be considered that many actors, both human and nonhuman, are included, and the network that makes up the learning space contains many actors. The following section first discusses the actors, and their interrelations based on the empirical data and then goes on to discuss how the learning spaces emerged through the teaching practices.

DISCUSSION: THE EMERGING NETWORK OF LEARNING SPACES

With ANT, actors are represented by effects or interrelations, whilst the interrelations themselves can also be actors. But how to differentiate between them is not always clear. During the observations of teaching practices, the obvious actors were the teachers, who set the teaching in motion. The teachers were responsible for the students' individual learning situations and for organizing the teaching every day given the available facilities and resources. During the interviews, the teachers commented on their own relationships to both people, such as the planners in local government or the principal, and things, such as the Persian blinds or the glazed internal walls. They also commented on the relationships between other people and things, such as, for example, between students and windows, or between students and the emergency exit space or the disabled-accessible bathroom. The students were the other obvious actors, as their learning is the intended effect of the teaching practice and the reason why the teachers are teaching. Furthermore, the local government planners who made decisions about the school design, technology, and furniture are also actors in the daily teaching practice. The city council appeared

as a powerful actor at the Bergen school and was mentioned by the teachers when they commented on the noise, furniture, and technology as obstacles and limitations for their teaching practices in the learning spaces.

The accessible toilet and the emergency exit space at one school emerged as learning spaces through these add-on areas being expanded and transformed into breakout spaces. This was not the result of a message left there by the architects or the planners, but rather a network effect within the learning space. Mediators bring other agencies into practice and contribute to 'framing' the teaching. This corresponds well with the perspectives of Jamie Wallace, who discussed perspectives on the acting person as user or maker, and argued that the affordances are often understood from the designer's viewpoint as the expected use, rather than being open to the perceptions of the users, which does not constrain the possible ways of using a certain design even if not planned for by the designer or architect.[47]

For all three learning spaces, the analysis showed how the right plug-ins were necessary to facilitate translations. For instance, new digital devices were not used if the teacher did not know how to use them, and glazed walls were covered if the teachers did not know what or how they could add to the learning spaces. If there is no translation, people and things exist side by side, but nothing happens. This implies that the articulations between actors are of importance in the actors being able to recognize each other's potentials and possibilities. Door closers, locks, and distance also appeared as actors in the learning spaces, such as at the Oslo school. When the students visited the bathroom, they were shut out of the teaching situation. The snap lock with the door closer created a power imbalance in which the children had to ask not only to go to the bathroom but also to be let back into the teaching space rather than simply entering quietly. The teacher was the only one with a key, which thus also served as a powerful actor.

The doors and distance also appeared as obstacles preventing use, such as in the case of the breakout spaces across the corridor in Oslo or even farther down the corridor at the Trondheim school. Even if more space was available for teaching, it was not inhabited because the distance caused the students to disengage from the teaching network. Distance consequently became a powerful actor in the teaching practice. If the breakout spaces are too far away from the classroom, the translations from the breakout spaces to the

other actors in the network of learning spaces fade or disappear, making the element of distance between the breakout space and the classroom a plug-in for translation to occur. As the findings showed, when breakout spaces were located too far away from the classroom, they dropped out of the network and thus were not part of the emerging learning spaces. This suggests that the design and planning of physical spaces should take distance thoroughly into account.

The findings show that teaching practices are the effects of design and architecture; for example, glass walls require training if they are to be handled successfully, and repetition is required before station work will run smoothly. As the teachers commented on the importance of repetition, such as in the relationships between teachers, students, and windows ('then we have to practice more') or with respect to the smooth organization of station work in open learning spaces ('yes, but we have done it many times'), repetition in the teaching practices was introduced as a network effect. Furthermore, the teachers' competencies within the physical environments as well as in teaching and learning worked as plug-ins to make translations happen between the actors in the emergence of the learning spaces.

The teaching processes were planned and routines established as part of an objective timeliness. With reference to the collapse of objective and subjective time in Latour's works,[48] timely alignments of the teaching process (for instance, the walls, doors, locks, furniture, indoor climate, and regulations) perform the learning spaces. The students at the Oslo school routinely walked quietly through the corridors, and, at the Trondheim school, the teachers concluded that when there is a problematic relationship between the students and the window between the classroom and the corridor, they had to practice more to set the routines.

The subjective experience of the teaching process can, however, differ between teachers and students. In teaching, no two days will ever be the same, even if routines are established and followed. Thus, the timing within the learning space may have elements of interruption and delay. Teaching is an effect, but it also affects other networks, and the windows from the classrooms to the hallway at the Trondheim school affected the teachers' control of the learning. Moreover, though the teachers used the breakout spaces, weak plug-ins resulted in reduced floor space in the learning spaces.

Through a sociomaterial lens, different aspects of power appeared in different interrelations. For instance, the Bergen teachers covered the glass walls and thereby silenced the architect. The teachers interacted with the physical environment in the schools in such a way so as to support, renew, and improve the learning spaces; but the teachers' mission was challenged. In one example, the architect who designed the school building and left both the design manual and the built asset was still acting in it 'through indirect but fully traceable connections'. With reference to Latour, [49] this revealed a circuit between the architect's generic classroom and the classroom today, with the vehicles, shifts, movements, and translation between loci in the foreground rather than the loci themselves. For this study, disentangling the flows of actions, people, and things as networks required examining several translations, the ones that re-created the learning spaces, and the interrelations that constituted them. Through applying the ANT concepts of translation, plug-ins, and articulation, this article has examined how architecture and pedagogy interact during teaching practices. A central finding in this study is that school routines and cultures not only structure what takes place but also make the learning spaces themselves.[50] As such, learning spaces are effects of teaching practices.

FINAL COMMENTS

This article has explored the emergence of learning spaces through the heterogeneous relationships between people and things within teaching practices, and shown how teachers and students adapt to physical learning environments as well as how the physical learning environment adapts to the teaching practices. Data were collected during on-site observations, and the perceptions and narratives of six teachers were obtained through interviews. Themes such as glazed walls, windows, blinds, break-out spaces, accessible bathrooms, and noise from the outside emerged from the analysis of teaching practices in three different classrooms and appeared in the network of the learning spaces, along with human actors such as teachers, students, architects, and local government planners.

The findings of this study partly confirm that teachers adapt to the spaces available. At the same time, the physical learning environments are also adapted in the emergence of the learning spaces. Things become actors in the network of learning spaces not as a result of their appearance but through what they do and how they behave. In the course of the teaching process, the

human and nonhuman actors simultaneously adapt and are adapted, and the learning spaces emerge within this assemblage. Thus, the human actors are makers of learning spaces through their inhabiting of the school buildings. In the words of Wallace, one might say: 'By defining users as makers, we can highlight the incomplete and embryonic nature of the design process and the limitations it exerts on the ways technologies are enacted through practice.'[51] With this perspective in mind, the design of the physical learning environment is not a final result but rather a starting point for the shaping, making, always moving, and emerging of learning spaces.

The sociomaterial perspective highlights how learning spaces are as much a product of social construction as of technical innovation and devices in the built environment. The learning spaces are the result of the development of fluid networks of heterogeneous associations between both human and nonhuman actors. The interrelations between the actors are central to the building's translation process and turn the process into transitions rather than transferences. Policy, physical infrastructure, technology availability, routines, user-friendliness, economic models, culture, and competence are all factors that influence the physical learning environment. The empirical findings of this article can consequently contribute to (1) the governance of school design, (2) school leadership relative to the opportunities in school design, and (3) architects of school design.

Finally, one question remains: 'How can school buildings with different designs and architectures work well for different purposes and different teachers and students?' The simple answer to this question might be that teachers and classrooms both adapt and are adapted to. It is, however, in the process of making learning spaces that teachers must obtain the right plug-ins such as knowledge and competence.

NOTES

[1] Ulla Johansson, 'Curriculum History as Lived History', in Ian Grosvenor, Martin Lawn, and Kate Rousmanier (eds.), *Silences and Images: The Social History of the Classroom* (New York: Peter Lang, 1999).

[2] Ian Grosvenor, Martin Lawn, and Kate Rousmanier, 'Introduction', in idem (eds.), *Silences and Images: The Social History of the Classroom* (New York: Peter Lang, 1999), p. 6.

[3] Larry Cuban, *How Teachers Taught* (New York: Longman, 1984). p. 48.

[4] Anthony Giddens, *Central Problems in Social Theory: Action, Structure and Contradiction in Social Analysis* (London: Palgrave, 1979), p. 202 .

[5] Sarah Healy, 'Evaluating Spaces of Pedagogic Affect', in Wesley Imms, Benjamin Cleveland, and Kenn Fisher (eds.), *Evaluating Learning Environments: Snapshots of Emerging Issues, Methods and Knowledge* (Rotterdam, Boston, and Taipei: Sense Publishers, 2016), p. 235.

[6] Jane McGregor, 'Spatiality and the place of the material in schools', *Pedagogy, Culture & Society* 12, no. 3 (October 2004), pp. 347–72; Dianne Mulcahy, Ben Cleveland, and Helen Aberton, 'Learning spaces and pedagogic change: envisioned, enacted and experienced', *Pedagogy, Culture & Society*, 23/4 (October 2015), pp. 575–95.

[7] Siv Marit Stavem, 'Governance of physical learning environments in a decentralized policy context', *Nordic Journal of Studies in Educational Policy* (November 2024).

[8] Tara Fenwick, Monika Nerland, and Karen Jensen, 'Sociomaterial approaches to conceptualising professional learning and practice', *Journal of Education and Work*, 25/1 (February 2012), pp. 1–13; Anna Kristiina Kokko and Laura Hirsto, 'From physical spaces to learning environments: processes in which physical spaces are transformed into learning environments', *Learning Environments Research*, 24/1 (April 2021), pp. 71–85; Mulcahy et al., 'Learning spaces and pedagogic change'.

[9] Kokko and Hirsto, 'From physical spaces to learning environments'.

[10] Eirin Tone Hestnes Elfmark, 'Fysisk læringsmiljø. Hvordan lede arbeidet med å gjøre klasserommet til en aktør i elevenes læring? NTNU, 2022; Rita Dybvik Frøyen, 'To skoler. To konsepter. Ulike erfaringer', NTNU: Ålesund, 2018.

[11] Erlend Vinje, 'Baseskoler og viktige lærerkompetanser. Hva mener lærerne?' *FormAkademisk - forskningstidsskrift for design og designdidaktikk*, 4/2 (December 2011).

[12] Harry Daniels, Hau Min Tse, Andrew Stables, and Sarah Cox, 'School Design Matters', in Harry Daniels, Hau Min Tse, Andre Stables, and Sarah Cox (eds.), *Designing Buildings for the Future of Schooling* (London and New York: Routledge, 2019).

[13] Torin Monahan, 'Flexible Space & Built Pedagogy—Emerging IT Embodiments', *Inventio*, 4/1 (2002), p. 8.

[14] Lisa Rosén Rasmussen, 'Building Pedagogies: A Historical Study of Teachers' Spatial Work in New School Architecture', *Education Inquiry*, 12/3 (January 2021), pp. 1–24.

[15] Martin Lawn, 'The Classroom as a Technology', in Ian Grosvenor, Martin Lawn, and Kate Rousmanier (eds.), *Silences and Images: The Social History of the Classroom* (New York: Peter Lang, 1999), pp. 63–82.

[16] Lawn, 'The Classroom as a Technology', p. 73.

[17] Anna Kristín Sigurðardóttir and Torfi Hjartarson, 'The idea and reality of an innovative school: From inventive design to established practice in a new school building', *Improving Schools*, 19/1 (March 2016), pp. 62–79.

[18] Sigurðardóttir and Hjartarson, 'The idea and reality of an innovative school'.

[19] Inés Dussel, 'Digital Classrooms and the New Economies of Attention: Reflections on the End of Schooling as Confinement', in Kate Darian-Smith and Julie Willis (eds.), *Designing Schools: Space, Place and Pedagogy* (London and New York: Routledge, 2017).

[20] Ivan D. Ilich, *Deschooling Society* (London: Calder & Boyars, 1971).

[21] Paolo Freire, *Pedagogy of the Oppressed: 30th Anniversary Edition*, trans. M.B. Ramos (Bloomsbury Publishing, 1970, 2005).

[22] Michel Foucault, 'Governmentality', in Graham Burchell, Colin Gordon, and Peter Miller (eds.), *The Foucault Effect: Studies in Governmentality* (Chicago: Chicago Press, 1991), pp. 87–104.

[23] Jan Nespor, 'Finding Patterns with Field Notes', in Judith L. Green, Gregory Camilli, and Patricia B. Elmore (eds.), *Handbook of Complementary Methods in Education Research* (Mahwah, NJ: Lawrence Erlbaum and AERA, 2006), pp. 297–308.

[24] Tara Fenwick, 'Sociomateriality and Learning: A Critical Approach', in David Scott and Eleanore Hargreaves (eds.), *The SAGE Handbook of Learning* (London: SAGE Publications Ltd, 2015), p. 83.

[25] M. Callon, 'Actor Network Theory', in Neil J. Smelser and Paul B. Baltes (eds.), *International Encyclopedia of the Social & Behavioral Sciences* (Oxford: Pergamon, 2001), pp. 62–66.

[26] Tara Fenwick and Richard Edwards, *Actor-Network Theory in Education* (London and New York: Routledge, 2010).

[27] Fenwick and Edwards, *Actor-Network Theory in Education*, p. 10.

[28] Bruno Latour, *Reassembling the Social* (London: Oxford University Press, 2005), p. 207.

[29] Iwona Janicka, 'Who Can Speak? Rancière, Latour and the Question of Articulation', *Humanities*, 9/4 (December 2020), p. 123.

[30] Callon, 'Actor Network Theory'; John Law, 'Actor Network Theory and Material Semiotic', in Bryan S. Turner (ed.), *The New Blackwell Companion to Social Theory* (Chichester, UK: Wiley-Blackwell, 2009), pp. 141–58.

[31] Bruno Latour and Albena Yaneva, 'Give Me a Gun and I Will Make All Buildings Move: An ANT's View of Architecture', *Ardeth: A Magazine on the Power of the Project*, 1 (2017), pp. 103–11.

[32] Law, 'Actor Network Theory and Material Semiotic'.

[33] Jonas Nordquist and Maria Watter, 'Participatory design beyond borders', *European Journal of Education*, 52/3 (September 2017), pp. 327–35.

[34] Peter Barrett, Fay Davies, Yufan Zhang, and Lucinda Barrett, 'The impact of classroom design on pupils' learning: Final results of a holistic, multi-level analysis', *Building and Environment*, 89 (July 2015), pp. 118–33.

[35] Bent Flyvbjerg, 'Five Misunderstandings About Case-Study Research', *Qualitative Inquiry*, 12/2 (April 2006), pp. 219–45.

[36] Danila D'Errico and Nigel Hunt, 'Place responsiveness: IPA walking interviews to explore participants' responses to natural disasters', *Qualitative Research in Psychology*, 19/2 (April 2022), pp. 346–59; Jonathan Lynch and Greg Mannion, 'Enacting a Place-Responsive Research Methodology: Walking Interviews with Educators', *Journal of Adventure Education and Outdoor Learning*, 16/4 (October 2016), pp. 330–45.

[37] Mathias Decuypere, 'Visual Network Analysis: a qualitative method for researching sociomaterial practice', *Qualitative Research*, 20/1 (February 2020), pp. 73–90.

[38] Catherine Adams and Terrie Lynn Thompson, 'Attending to Objects, Attuning to Things', in idem (eds.), *Researching a Posthuman World: Interviews with Digital Objects* (London: Palgrave Macmillan UK, 2016), p. 40.

[39] Catherine Adams and Terrie Lynn Thompson, 'Interviewing Objects as Co-researchers', in idem (eds.), *Researching a Posthuman World: Interviews with Digital Objects* (London: Palgrave Macmillan UK, 2016), p. 89.

[40] Peter C. Lippman, *The L-Shaped Classroom: A Pattern for Promoting Learning* (DesignShare, *DesignShare (NJ1)* (October 2004).

[41] Belinda Mittermeier and Leon Benade, 'Do innovative approaches to time allocation and timetable organisation provide a compelling alternative to traditional models?', *Educational Review*, 76/7 (2024), p. 4.

[42] Latour, *Reassembling the Social*.

[43] Bruno Latour, 'Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts', in Wiebe W. Bijker, John Law, W. Bernard Carlson, and Trevor Pinch (eds.), *Shaping Technology/Building Society: Studies in Sociotechnical Change* (Cambridge, MA: The MIT Press, 1992), pp. 225–58.

[44] Bruno Latour, 'The Powers of Association', in John Law (ed.), *Power, Action and Belief: A New Sociology of Knowledge* (London and Boston: Routledge and Kegan Paul, 1986), p. 267.

[45] Neil Gislason, 'Architectural design and the learning environment: A framework for school design research', *Learning Environments Research*, 13/2 (July 2010), pp. 127–45.

[46] Bruno Latour, *Reassembling the Social* (London: Oxford University Press, 2005), p. 194.

[47] Jamie Wallace, 'Makers not Users—The Material Shaping of Technology Through Use', *Cursiv*, 16 (2015): *The Stranger—on the Understanding of, and Socializing of, the Stranger in a Globalized and Constantly Changing World* (Copenhagen: Aarhus University/Danish School of Education, 2015), pp. 99–116.

[48] Bruno Latour, 'On actor-network theory: A few clarifications', *Soziale Welt*, 47/4 (1996), pp. 369–81.

[49] Latour, *Reassembling the Social*, p. 196.

[50] Mittermeier and Benade, 'Do innovative approaches to time allocation and timetable organisation provide a compelling alternative to traditional models?'

[51] Wallace, 'Makers not Users—The Material Shaping of Technology Through Use'.

CONTRIBUTORS

EDITORS

Magnus Rönn, architect and associate professor, is editor-in-chief of *The Nordic Journal of Architectural Research* and founding co-editor at the Nordic Academic Press of Architectural Research. From 2004 to 2016, Rönn held the position of research leader in the School of Architecture at the KTH Royal Institute of Technology, teaching at an advanced level. From 2016 to 2025 he was affiliated with the Chalmers University of Technology. Together with colleagues, Rönn has been the theme editor for the publishing of four special issues on competitions in two scientific journals (2009, 2012, 2013, 2014). He has also published five books on architectural competitions: three anthologies in English (2008, 2013, 2016) and two monographs in Swedish (2005, 2013). In cooperation with two colleagues, Rönn has edited four anthologies (2014, 2015, 2020, 2025) dealing with compensation measures in comprehensive planning and detailed planning in areas with cultural heritage.

Anne Elisabeth Toft, architect and PhD, specializes in architectural history and theory. Her research addresses questions of representation in architecture. Toft is an associate professor at the Aarhus School of Architecture. She has participated in group and solo exhibitions on architecture and architectural photography in Denmark and abroad. She has curated exhibitions on architecture and photography, and has written about architecture, architectural education, architectural photography, and the visual arts. In 2014, she co-founded the Photobook Week Aarhus, the first photo festival in Denmark devoted to the photobook and its discourse. She is a member of the European Society for the History of Photography and of the international research committee for the iphi awards, and served on the jury of the Danish Society of Artists from 2014 to 2020. Since 2015, she has been the president of the Nordic Association of Architectural Research (NAF/NAAR) and founding co-editor at the Nordic Academic Press of Architectural Research.

SECTION I

Tim Anstey, architect and historian, is director of the PhD Programme at the Oslo School of Architecture and Design, and a member of OCCAS, the Oslo Centre for Critical Architectural Studies. His books include *Things That Move: A Hinterland in Architectural History* (The MIT Press, 2024); *Warburg Models: Buildings as Bilderfahrzeuge*, with Mari Lending (Hatje Cantz, 2023); *Images of Egypt*, with Mari Lending and Eirik Bøhn (Pax, 2018) and *Architecture and Authorship*, with Katja Grillner and Rolf Hughes (Black Dog Publishing, 2007). Anstey is part of *Provenance Projected: Architecture Past and Future in the Era of Circularity*, and contributed to *The Printed and the Built: Architecture and Public Debate in Modern Europe*. EU research projects have included *PRIARC Printing the Past: Architecture, Print Culture, and Uses of the Past in Modern Europe* (EU HERA) and the Marie Sklodowska-Curie Actions projects *TACK: Communities of Tacit Knowledge in Architecture*. With Mari Lending he has designed and curated three exhibitions for OCCAS in Oslo, Hamburg, and London.

Saija Hollmén, architect and Professor of Practice in Humanitarian Architecture at the Aalto School of Arts, Design and Architecture, is a co-founder and leader of the interdisciplinary Aalto WiTLAB (Aalto World in Transition Research LAB), which focusses on global sustainability and humanitarian challenges through cross-disciplinary research and pedagogy. She is responsible for the *Interplay of Cultures* programme, based at the Department of Architecture, which deals with architectural design and planning in cultures outside Europe. Her research, informed by her architectural practice in the Global South, focusses on cultural locality and interdisciplinary pedagogies in architectural education. Hollmén is also a co-founder of the award-winning Hollmén Reuter Sandman Architects and the Ukumbi NGO, which aim to provide architectural services for communities in need. Their work has been widely exhibited, for instance, at the Venice Biennale in 2002, 2004, and 2016. Ukumbi was also awarded the Finnish State Award for Art in 2009 for its contributions to culturally sensitive and respectful architecture.

Albena Yaneva is a sociologist and architectural theorist whose research transcends the boundaries between science studies, architectural theory, cognitive anthropology, and political philosophy. She is a full professor at the Politecnico di Torino, and is the author of seven monographs: *The Making of a Building* (2009), *Made by the OMA: An Ethnography of Design* (2009),

Mapping Controversies in Architecture (2012), *Five Ways to Make Architecture Political: An Introduction to the Politics of Design Practice* (2017), *Crafting History: Archiving and the Quest for Architectural Legacy* (2020), *Latour for Architects* (2022), and *Architecture After Covid* (2023). She co-authored *The New Architecture of Science: Learning from Graphene* (2020) with the Nobel Laureate in Physics Sir Konstantin S. Novoselov. Yaneva has held the prestigious Lise Meitner Visiting Chair in Architecture at the University of Lund, Sweden, as well as visiting professorships at the Princeton School of Architecture and Parsons School of Design. Her work has been translated into ten languages. Yaneva is the recipient of the Royal Institute of British Architects (RIBA) President's award for outstanding university-based research.

SECTION II

Matthew Ashton is an architect and PhD candidate at RMIT University Melbourne, as well as a guest researcher at the Royal Institute of Technology (KTH) Stockholm. His research examines the wider environmental impacts of architecture through exploring material flows, landscapes of extraction, and walking as a creative research practice. Recently published work includes the chapter 'Art in Concrete and the Swedish Building Industry', co-authored with Erik Stenberg and published in *Architecture and Welfare: Scandinavian Perspectives*, edited by Thordis Arrhenius, Ellen Braae, and Guttorm Ruud (Birkhauser, 2025).

Violaine Forsberg Mussault is a French-Norwegian landscape architect and a PhD research fellow based in Oslo, Norway. She graduated from the Ecole Nationale Supérieure du Paysage (Versailles, France). In both her research and practice, Violaine explores the intersection of design methods, participatory approaches, and living processes. Her PhD research focusses on site reading methods and cartographic practices in an unstable mountain landscape, adopting a more-than-human and transdisciplinary perspective. For the past fifteen years, Violaine has been a partner in the French collaborative design studio Les Saprophytes, where she has led projects on the commons and urban ecology, and on using bottom-up processes in post-industrial peripheries. Additionally, she has taught community engagement, agroecology, and design studio courses at the Faculty of Architecture and Landscape in Lille, France. Alongside her research, she is a landscape architect adviser to the French State.

Vignir Freyr Helgason is an architect and a PhD fellow at the Oslo School of Architecture and Design (AHO), Institute of Urbanism and Landscape. His current research is approached from the perspective of inter- and transdisciplinary urbanism and heritage. He holds a master's degree (Cand.Arch.) in architecture from the Royal Danish Academy in Copenhagen and an executive master's degree in architectural heritage from AHO. Freyr Helgason's experience spans both the private and public sectors, encompassing practical, strategic, and theoretical work. He has worked on architecture and planning projects in Iceland, Denmark, and Norway, as well as with urban heritage at the Directorate for Cultural Heritage in Norway (Riksantikvaren). In addition to his work at AHO, he has had academic affiliations with the Iceland University of the Arts (LHÍ) and the Agricultural University of Iceland (LBHÍ).

Matilde Kautsky is an architect and a PhD candidate at the Royal Institute of Technology in Stockholm, with an interest in just cities and equitable living conditions. The research in her dissertation investigates how societal changes materialize in everyday architecture, in order to understand more about how the societal ideals in the urban design of different eras impact contemporary living conditions. Schools and schoolyards in the Stockholm municipality are used as an example of everyday architecture and as the lens through which changes in society are traced. She teaches in the master's programme for Sustainable Urban Planning and Design (SUPD) at the Royal Institute of Technology in Stockholm.

Siv Marit Stavem is an educational planner and a PhD candidate at the University of Oslo, Faculty of Educational Sciences. With a background in education, her PhD dissertation focusses on the governance and planning of physical learning environments in a decentralized governance setting in Norway. In addition to her academic pursuits, she currently holds a position as an educational planner at Norconsult Norge AS, where she collaborates with teachers, school leaders, designers, and architects across various educational settings in Norway. Her role as an educational planner involves developing and implementing authentic values so as to transform and create physical learning environments that facilitate effective education practices from early childhood to tertiary education.

Beatrice Stolz is an architect and a PhD student at the Norwegian University of Science and Technology (NTNU) in Trondheim, Norway. She has a background in architecture from the School of Architecture of Paris La Villette and in the science of sustainable architecture from NTNU. Her research focusses on circular developments in neighbourhoods, where she takes a holistic approach to different qualities of the built environment so as to understand the circular potentials present in different areas of cities, using Trondheim as a case study. Her research is part of the Circular City research project, a transdisciplinary collaboration to better understand the role of existing buildings as a resource base for the future development of cities. It is funded by NTNU's Sustainabilities SusRes Initiative, which supports interdisciplinary projects focussing on a system-based understanding of sustainable transitions.

PEER REVIEWERS

Mark Andrejevic, Professor
Monash University
Email: Mark.Andrejevic@monash.edu

Laura Katariina Berger, Postdoctoral Researcher
Aalto University
Email: laura.berger@aalto.fi

Sverre Bjerkeset, Guest Researcher
Oslo School of Architecture and Design
Email: sverre.bjerkeset@aho.no

Martine Buser, Associate Professor
Chalmers University of Technology
Email: buser@chalmers.se

Raul Castaño de La Rosa, Senior Research Fellow
Tampere University
Email: raul.castanodelarosa@tuni.fi

Ben Cleveland, Principal Research Fellow
University of Melbourne
Email: benjamin.cleveland@unimelb.edu.au

Anne Corlin, Associate Professor
Aarhus School of Architecture
Email: ac@aarch.dk

Stefan Darlan Boris, Associate Professor
Aarhus School of Architecture
Email: sdb@aarch.dk

Henriette Ejstrup, Associate Professor
Royal Danish Academy
Email: hejs@kglakademi.dk

Jorge Gil, Associate Professor
Chalmers University of Technology
Email: jorge.gil@chalmers.se

Ute Groba, Associate Professor
The Oslo School of Architecture and Design
Email: Ute.Christina.Groba@aho.no

Ellen Kathrine Hansen, Associate Professor
Aalborg University
Email: ekh@create.aau.dk

Claudia Moscoso, Research Manager
SINTEF
Email: claudia.moscoso@sintef.no

Raine Mäntysalo, Professor
Aalto University
Email: raine.mantysalo@aalto.fi

David Pinder, Professor
Roskilde University
Email: dpinder@ruc.dk

Henriette Steiner, Professor
University of Copenhagen
Email: hst@ign.ku.dk

Marie Strid, Senior Lecturer
Chalmers University of Technology
Email: marie.strid@chalmers.se

Helena Teräväinen, Senior Researcher
Aalto University
Email: helena.teravainen@aalto.fi

Petra Thorpert, University Lecturer
Swedish University of Agricultural Sciences
Email: Petra.Thorpert@slu.se

Katrina Wiberg, Associate Professor
Aarhus School of Architecture
Email: kw@aarch.dk

Veronika Zaikina, Associate Professor
University of South-Eastern Norway
Email: Veronika.Zaikina@usn.no

Leif Östman, Principal Lecturer
Novia University of Applied Sciences
Email: Leif.Ostman@novia.fi

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