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INDUSTRIAL ARCHITECTURAL RESEARCH  
– POTENTIAL, PURPOSE, RELEVANCE AND IMPACT

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## **EDITORS' NOTES** **INDUSTRIAL ARCHITECTURAL** **RESEARCH – POTENTIAL, PURPOSE,** **RELEVANCE AND IMPACT**

**JONNA MAJGAARD KRARUP AND**  
**CAMILLA HEDEGAARD MØLLER**

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This themed issue focuses on the architectural research and production of knowledge developed and conducted in collaboration with and/or under the auspices of industrial partners, foundations and academic institutions of various types.

The purpose of this themed issue is to examine how this type of research comes about, is organised and conducted and how its results are disseminated and implemented. Thus, the purpose is also to study various perceptions of knowledge and the production of knowledge in the academic community, professional practice and industry – and the issues associated with this.

The theme emanates from what we, as researchers and educators at the Royal Danish Academy in Copenhagen, consider a general orientation of research towards various types of developmental tasks and research, organised as collaboration projects between the academic world, the business community, foundations, public institutions and decision makers.

Like many other research colleagues affiliated with public research institutions in Denmark and abroad, we both observe and note that a rising percentage of our research is expected to be funded by external sources, which must be applied for in collaboration with external, non-academic

partners. This is true both when it involves the launching of a new Ph.D. project, i.e., the primary training of researchers, and the financing of subsequent post-doc projects and research projects in general.

This themed issue was motivated by and is based on our own observations and lessons learnt from research collaboration across the academic, industrial and practice communities, as well as by a desire to learn more about the structural framework and conditions to which our research is subject and, possibly, how this framework and these conditions affect research issues, processes, the choice of methodology, aims, results and the ways in which research results are disseminated.

This involves international development and practice, which is partly the result of international and national policy decisions, agreements and strategies, such as: the Bologna and Lisbon processes from 1999 and 2000 respectively (the latter was revised in 2010); the Barcelona objectives (2002); Denmark's University Act (2003); the Danish Government's plan *Nye veje mellem forskning og erhverv – fra tanke til faktura* (new pathways between the research and business communities – from idea to invoice) (2003); Denmark's Globalisation Strategy (2006); as well as the conditions and needs deriving from this in the world of research, industry, business and foundations (Aagaard, 2010; Hansen, 2012; Faye & Budtz Pedersen, 2012).

In brief, it describes a trend from Mode 1 to Mode 2 in research, i.e., a transition from individual-orientated, basic research to interdisciplinary and applied research. Mode 1 is characterised by being defined and executed in a primarily homogeneous academic, discipline-controlled context. Mode 2 is interdisciplinary and formatted in network-based ad hoc projects and characteristically includes stakeholders and possibly players not trained in research (Gibbons et al., 1994). Thus, Mode 2 represents a shift from a possible, but not always present, interdisciplinary form of collaboration found in Mode 1, characterised by interpretations between various discourses, to an interdisciplinary form of collaboration, characterised by an external management component.

Other designations of Mode 2-like cooperation structures include Triple Helix, which refers to innovation and research interactions brought about in collaboration projects involving the academic and business communities together with government agencies (Leydesdorff & Etzkowitz, 1996), traditionally targeting a knowledge-based economy and a knowledge-based society.

Yet designations such as *post-academic science* (Zimann, 2000), *socially robust knowledge* (Nowotny et al., 2001) and *post-normal science* (Funtowicz & Ravetz, 1993) are also seen within Mode 2.

Generally speaking, the trend illustrates a shift in the perception of what defines research, its purpose and how it is organised.

The trend prompts new questions about academic freedom: does this trend threaten it and is the knowledge produced valid and generally applicable? The perception of general applicability as an ambition and a stamp of quality for research-generated knowledge is challenged by other perceptions of knowledge, which, on the one hand, are described as situated and collective and, on the other, codified and thus accessible to only a few.

In addition, this raises the question of the extent to which researchers and their research lose autonomy and integrity by joining cooperation clusters in which financial and instrumental purposes are also represented and active in the articulation of research issues, methodology and dissemination formats.

The researchers themselves come under pressure from their home institutions and external players, as well as from the research environment itself, exemplified by the raising of external funds becoming a competitive parameter during the career advancement of the individual researcher. At an institutional level, the raising of external research funding is presented as a stamp of quality and is a competitive and branding parameter among academic institutions.

The development of the theme started with a call for abstracts to relevant research communities. A selection of promising proposals was then conducted by the invited theme editors, Dr. Jonna Majgaard Krarup and Dr. Camilla Hedegaard Møller at the Royal Danish Academy in Copenhagen. The selection was conducted in cooperation with Dr. Daniel Koch, representing the journal, and Dr. Anna Braide from the board of NAAR (the Nordic Association of Architectural Research). The final check of the scientific quality has been done in a joint venture with Dr. Marius Fiskevold and Dr. Magnus Rönn, both editors-in-chief of the journal.

This themed issue's articles reflect on the issues raised in the call for Industrial Architecture Research.

We specifically called for:

*(...) critical reflections on industrial research within architecture and construction, and its possible implications on the content, the quality and character of architectural research. We are looking for theoretical and/or empirical research into and reflections within the following areas:*



*Industrial architectural research, power, management and control of research.*

*Who defines and phrases research strategies, research questions and relevance; who benefits from the research; what is the purpose; how and where is this knowledge realised and embedded?*

*Specific organisation at the different parties' end and collaboration forms.*

*How is industrial research organised and implemented in architectural practice? Which collaboration forms are adapted and who form part of the research team? Which challenges, issues and potentials can be observed?*

*Knowledge concepts, theories and research methods.*

*Which perceptions of knowledge and research are at stake? How is research-based knowledge perceived and dealt with in interdisciplinary practices? Which research methods are developed and practised in industrial architectural research? Are different perceptions of knowledge of importance to the architectural profession in the development of industrial research?*

The cooperation form itself and some of the challenges entailed are clearly articulated throughout the articles. Some of the authors have clearly been working in isolation, notably as researchers, perhaps even as Ph.D. students, in a context where culture, norms and expectations of both researcher and research were based on completely different understandings and purposes than the researcher had himself/herself, and where getting the practical execution of the project to run smoothly made it necessary first to identify a common language or tool to which everyone could relate and use.

This could include legal contracts, business plans, business reports, negotiations, alignment of expectations, communication embargoes, types of critique and understanding, drawings and technologies to facilitate the cooperation and production of knowledge.

The researcher's academic and methodological preparedness, experience, empathy and ability to listen and try to understand, find compromises and interpret, as well as the researcher's social skills and ideas are also put to work – while having to conduct research at the same time. Therefore, it is tempting to ask whether the individual researcher is required to possess unique social skills – in addition to academic and scientific skill sets – to enter into cooperation projects of this nature? Also, do such projects require a heightened alertness from the researcher's colleagues or supervisors and from the foundations or councils providing the funding? Two of the authors directly draw attention to this last-mentioned need.

## Introduction of the articles

What adverse implications can a researcher encounter if a controversial private company supports research into an issue in which the company is itself involved? Are research funds from a private, commercial undertaking less valuable than if they had been granted by a foundation? And can the private undertaking's name and logo have a negative connotation that adversely affects other researchers' perception of the research?

This is the issue Marie Stender deals with in her article, "Dilemmas in Industrial Research – Exploring the Copenhagen Balcony Boom," in a personally experienced narrative about the research project, "The Social Life of Balconies". Her perspective is rooted in anthropology, and targets the relationship between the industrial researcher, the research institution and the funding providers.

Rather than give an account of her research project's results, Marie provides empirical insight into the researcher's work process: from identifying an actual need for knowledge, to a multiple-stage, fund-raising process, to the organisation of the research project, access to persons providing information and the final dissemination of the results.

Marie describes and reflects on how funding providers have influenced the process and research, and on the deliberations underlying researchers' choices and paths not taken along the way. The article takes the position that knowledge is situated and always created in a collective of sorts. At the same time, the author explains how the researcher's freedom is secured in a legal contract and in part by the fact that the researcher himself/herself has formulated the project's idea. Is it then paradoxical to bring up freedom of research at the individual level if the production of knowledge is collective and influenced along the way?

If we accept that research is and will be influenced, and do not perceive this influence as wrong or negative (see Berker), then we need to shift the focus from the issue of influence, or the lack of it, to *how* and *when* research is influenced and the implications of this.

The empirical narrative shows how researchers' ideas of how others perceive the commercial funding provider end up playing a major role along the way – both initially and during the dissemination of research results. In addition, Marie Stender interestingly addresses how researchers relate to one funding provider's possible commercial exploitation of the research and its significance for the process.

In their article, "Developing a new culture of industrial research in architecture," architects and researchers Nini Leimand and Anne Beim explain the story of how the first industrial Ph.D. came about at the Royal

Danish Academy (previously KADK/KA). Nini was the first industrial researcher (as a Ph.D. student), and Anne was the first academic industrial Ph.D. supervisor.

The article provides a historical account of how a long-standing community of interests in block masonry develops into an outright industrial research project that must generate valid, research-based knowledge as well as commercial value for the project's industrial partners. The research project is the result of years of collaboration between the academic community and professional practice during which a series of publications gradually helped build up knowledge. At the time, the fact that architectural researchers could even consider applying for funding for an industrial Ph.D. project was quite new. As the title of the article suggests, there was a need to develop a new culture of research and research-based practice.

The article is written from the perspective of the educational and research institution. From this vantage point, Nini and Anne point out that there was insufficient literature and knowledge about block masonry at the school of architecture, i.e., not only at the commercial partners. In this context, we see how the need for knowledge arose from both professional practice and educational activities. Nini and Anne question whether the institution should not have benefited more from industrial research projects such as this, through compulsory lectures for instance. They also point out that the ongoing quality assurance of industrial research in the academic research environment can be challenged by insufficient contact between an industrial researcher and his/her research institution.

What characterises the research practice described in the article? Specifically, the industrial researcher is introduced firstly as an architecture student who is interested in block masonry, then as an instructor at the school of architecture and finally as an architect designing and having her own house built in block masonry together with her partner. She subsequently assumes the role of an industrial researcher, of a consultant, of an 'academic bridge-builder' and, finally, of an expert and communicator on national TV. The example shows how the industrial researcher has related to the topic of 'block masonry' through a wide range of roles with various purposes. Similarly, the researcher's own house plays multiple parts in the narrative: family home, empirical data and case study in the research project, as well as a tangible physical and visual communicator of block masonry to professional colleagues and the general public. In terms of research methodology, it is also remarkable that the drawing becomes a key instrument of the research, which assists in developing and communicating new knowledge about block masonry in a manner that can be used by the industrial partners.

The industrial researcher, the instructor, the practising architect and the public communicator gravitate to block masonry and change practice depending on their role. In so doing, the same person can generate new research-based knowledge and learn lessons that can be passed on and interpreted for industrial partners, students, colleagues and the general public. It is reasonable to assume that in this instance the researching architect displays a unique capacity, notably by virtue of being both an architect and a researcher.

In their article, “Expectations to academic critique in industrial architectural research,” Sidse Gudmand-Høyer and Marius Gudmand-Høyer direct their attention to academic critique and to what parties expect the critique must achieve as a crucial element of the process. They attach less importance to the idea of aligning expectations in the early phases, by arguing that in many instances the parties do not know what to expect.

Gudmand-Høyer and Gudmand-Høyer jointly represent an architectural-research and philosophical approach to the issue of academic critique. This is manifested, for instance, by virtue of their theoretical development of the concept of critique and by empirical examples taken from an industrial Ph.D. process. They initially touch on the unique challenges of industrial Ph.D. research at the levels of industrial researcher, research and institution. They identify several dilemmas in the encounter between dissociated, academic and critical research on the one hand, and the commercially based need for rapid utilisation of the research results on the other.

In this context, they emphasise how industrial research not only challenges classic research norms (see Berker) but is in direct contradiction to them. Carried to the extreme, a dichotomy emerges between an academic and impartial approach to a problem and a commercial, biased approach to the same problem.

The authors point out that the parties’ expectations of what they must obtain from academic critique can either bring them together or push them apart. The point taken here is that our expectations of critique have an impact on how we relate to it.

In this context, the authors develop perceptions of critique and conclude, among other things, that critique can be perceived as an affirming, shaping social practice that entails an acknowledgement of the fact that something new can emerge.

This interpretation contradicts the idea of critique as pointing out shortcomings, weaknesses and faults, a negative judgement, or an attempt to undermine what and who is being critiqued. The article’s empirical

examples enlarge on the implicit consequences of various expectations of critique. The authors believe these examples to be generally applicable to future industrial researchers.

Thomas Berker contributes to the collection of empirical cases in which widely different players are included in the same research project, whereby both concurrent and contradictory interests meet. As in the other articles, Berker describes how tensions, controversies and negotiations arise. In the article, “Negotiating research norms between academic and industrial research. The case of a research centre on zero emission buildings in Norway” he presents an analytical perspective that, in addition to providing nuanced insight into the problem area, proposes strategies for managing them in practice.

The empirical context is a long-standing, intersectoral research centre in the field of construction where Thomas himself was an active researcher with a social sciences background. The research centre is a good example of the desire to create tangibly useful research in the construction industry. In other words, it is a research centre charged with an explicit, problem-orientated task: to contribute to a more sustainable society in the future. The centre is a setting for encounters between what the article refers to as academic research and industrial research and the various research norms associated with them.

The various research norms can guide the actions and attitudes of researchers and non-researchers, and these norms can be embedded in an institutional or organisational framework. When incorporated into the same project, and the parties are forced to cooperate if they wish to remain in the project, the norms are simply a source of conflict.

Thomas cites three examples of how the parties managed the controversies and points out that these can serve as strategies for remaining in the same research project, despite the parties having different norms for the research as their point of departure.

In addition to offering procedural and inclusive strategies for managing conflicts and tensions in composite research projects, Thomas also shows that this type of research project assigns new tasks and roles to researchers: interpreting knowledge from one context to another; working to make new knowledge locally applicable; consulting work; compromising with non-researchers in the research process; and a willingness to negotiate on the research norms. Thomas recommends that these activities be used as tasks in themselves, that time be allotted for them and that they are included in the planning of the process.

In his article, Thomas Berker cites examples of how contradictory norms for research clash in utility-orientated, problem-solving research, which

includes parties from various sectors, including non-researchers with separate interests. He shows how instrumentalised research can be hazardous because it is manipulative and can be conflict-ridden in practice, but that it is also possible.

In addition to the research articles in this volume we have asked Kristine C. V. Holten-Andersen, industrial Ph.D. student, to present some of her work-in-progress as a photo essay. This contribution is presented in the Forum-section.

In her project, *Adapting Cities to Landscape and Climate > Prospects and Methods in Urban Planning*, Kristine has produced a series of fascinating mappings in which otherwise invisible sub-terrain water structures and flows are made visible, and thus these invisible but, in relation to climate change adaptation at an urban scale, important structures may become present as agents in urban planning processes.

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