Ute Poerschke and Oliver Schürer

Theorizing Technology in Architecture and Urbanism

Editorial

In Aristophanes' *The Birds*, written approximately 400 years before Vitruvius' *De architectura libri decem*, the birds decide to escape both from men and the gods and liberate themselves from both the tangible but imperfect everyday, and the ideal but abstract transreality. They found—in the space between earth and heaven—a city in the clouds: *cloud-cuckoo-land*.

Where is technology at home? The consideration of the technical capacity as intrinsically human (Giordano Bruno), its philosophical designation and the presentation of this capacity in art reveal the idealist view of technology. However, we speak of design techniques, planning techniques, building technology, technical environmental control systems, technical urban infrastructure and even of dwelling techniques. Thus, technology, technics, and techniques seem to belong foremost to the concrete everyday realm and to relate to processes and artifacts involved in the production, functioning, and use of architecture. Seen thus, architectural technology seems to possess a "narrow, limited and fragmentary character"[1] (Ernst Cassirer). Adolf Behne insists: "You cannot have both, technics and art."[2] However, technology is as much part of the fundamental sciences as it is part of the arts, because technical skills are needed to create both abstract knowledge and concrete works of art. Implying both parts in its domain, architecture has a special position among the various human creations between the everyday life and transreality. This can be seen today in the understanding of the world as a global *oikos*. John McHale, co-founder of the Independent Group, artist and sociologist, called for this understanding already in 1970.[3] Mark Wigley paraphrases McHale's call: "To examine the physiology and pathology of new technologies is to perform an architectural analysis."[4]

In this context, several questions occur: Which discourses have been developing within and against the classical-platonic notion of technology, and how have they influenced today's architectural concepts? In which way did modernistic ideas change technology into ornament, engineering aesthetics, representation of innovation, and performative and atmospheric

1 Ernst Cassirer (1930): "Form and Technology," in *Ernst Cassirer on Form and Technology*, edited by Aud Sissel Hoel and Ingvild Folkvord, (New York: Palgrave Macmillan) 2012: 15-53, esp. 20.

2 Adolf Behne: *Die Wiederkehr der Kunst*, (Leipzig: Wolff) 1919: 112 (German).

3 John McHale: *The Ecological Context* (New York: Braziller) 1970.

4 Mark Wigley: *Evolution-By-Prothesis*. In: Lechner, Andreas/Maier, Petra (Hg.): Stadtmotive (Wien: Selene) 1999: 159-93, esp. 168.

aesthetics? What roles do *smart environments*, *ambient intelligence*, or *locative media* play in architecture and urbanism? How do these changes affect aesthetic expression and use? These questions are continuously raised in the articles of the issue *Theorizing Technology in Architecture and Urbanism*.

For most articles, one can conclude that, on the one hand, architectural discourse still follows widely the traditional dichotomy of two distinct knowledge cultures, in which the technical-scientific one is secondary to the literary-humanistic knowledge (Charles Percy Snow). On the other hand, in the disciplines of the history and philosophy of technology a certain distance to architecture can be found. This is the more surprising as the philosophy of technology's most fundamental themes—technology's relationship to nature, art, and science—are of extraordinary relevance in architecture. This complex situation makes it important for architecture to start from its very own contexts when trying to fathom technology.

The twenty contributions in this issue show that the current discourse circles around three topical areas. In the first area—*Discourses*—the theoretical and historical contributions reveal the need to clarify the concept of technology in its relationship to art and science. Discussions about the differentiation of architecture and technology stand for the desire to reinstall the hegemony of culture above technology that was achieved in High Modernism and that seems to be lost by the digitalization of all areas of life. The second topical area—*Modernism(s)*—is about the question how modernism has interpreted and used technology in a wide range between high euphoria and sharp criticism. And the third topical area—*Data, Control, Space*—is about today's technology that is employed to master the current challenges in architecture. Digitalization, virtualization, and mediatization have radically changed the position and effect of technology in architecture. Thus, the contributions in this issue span between the traditional understanding of technology as the fundamental capacity to create architecture and the newer expanded understanding of technology as building-integrated artifacts and processes that make functioning and performance of architecture possible.

Discourses

The contributions in this section deliberate on the fundamental understandings of the relationships between technical and humanistic areas of knowledge and relate the findings to architecture. The authors approach the interpretation of technology with a great degree of suspicion: to believe that technology as a means leaves the original intention and the generated result unchanged would be indeed naïve. But the suspicion is more related to the self-dynamics of technical processes toward which continuous vigilance is cultivated (Mathias Mitteregger, Tom Schoper,

Christof Ehrlich). The discussion of Martin Heidegger's lecture *The Question Concerning Technology*, which he held in 1953 at the *Bavarian Academy of Fine Arts*, was obviously inevitable since several authors take Heidegger's text as the starting point for their deliberations. Discussing the ancient term of *techné* allows to break up the predetermined understanding of technology and to enrich it with new fundamental contents. In addition, the contributions in this section inquire the relations of architecture to science and art (Dean Hawkes, Daniel Grünkranz). Looking at all analyses and interpretations in this section, the complexity of the topic becomes more than apparent: again and again it presents itself as a hierarchical problem between scientific-technological thinking and artistic-subjective experience.

The historical change of the understanding of technology becomes even more visible when considering the increasing specialization of the professions (Moritz Gleich, Wolfgang Pircher, Adelheid Voskuhl). The historical attempt to distinguish between the two professions of architecture and engineering can be regarded as driven by an increased disagreement about the importance of technology in architecture. Commonly, we presume that engineering understands and uses technology as a means for optimization. In contrast, architecture uses and experiences technology and creates in its overcoming a piece of work. The articles reveal that particularly the representatives of the evolving engineering disciplines in the nineteenth century strove to define their own self-image. Engineers tried to break up the existing social order by claiming humanistic questions and social relevance for their own professions. A pronounced culmination of this effort is the quarrel about the British *Houses of Parliament*, in which the engineer claims he is the actual architect, because he creates an spatial atmosphere, while the official architect only builds the shell around this atmosphere.

Modernism(s)

The large number of contributions related to the topic of modernism shows the continuous influence of High Modernism as well as an ongoing differentiation into various modernisms. The articles reveal how different interpretations of technology have contributed to a divers spectrum of modernisms, partially in great contrast to High Modernism.

The first articles investigate how technology was used as an aesthetic element in early modernism (Antje Senarclens de Grancy, Dörte Kuhlmann). The examples relate explicitly to the use of electrical light at the turn of the nineteenth to twentieth century, testifying to the technology euphoria of the time. Electrical light increased the comfort of each individual and the collective, it supported the economy by allowing night shifts, and it created a new way of recreation in amusement parks.

Through that, technics and technology became part of culture and as such were expressed in architecture. Technology as an artistic topic required investigation and elevation of the perception of technology, and both were achieved through new means of technology such as photography and film. Beyond visual perception, artists and architects also explored the auditive, haptic, and spatial perception, for example by emphasizing new means of transportation such as the elevator, automobile, and streetcar. In this virtuous circle, technology was inflated and mystified and thus its importance confirmed.

At the same time, classic materials of architecture were challenged and new fundamental materials and building techniques/technologies were explored (Matthew Mindrup, Lynnette Widder). These new materials and techniques were understood as the expression of the modern time. Architects did not (only) systematize them in relation to practical needs such as durability and economy, but they defined the architect's task for the building industry as to be the expert of spatial, haptic, and general aesthetic qualities of material and construction technology. The *Bauhaus-Vorkurs* (preliminary course) is a famous example for that. Postwar architects–for example Kurt Schwippert and Sep Ruf–were more reluctant when it came to technology euphoria. Their questioning of the relationship between modern materials and contemporary architecture at the *Darmstädter Gespräch* 1953 shows the fine line between the self-dynamics of technological progress and the attempt to control technology.

Similarly, both fascination and critique have been shaping the divergent discussion of series and systems (Dave Fleischer, Alexander Henning Smolian, Sonja Hinilica). The advertising movie *All's Fair At The Fair* of 1938 shows an obsession with the increased power of industrialized mass production. Here, the architecture of modernisms is implicitly caricatured: its socio-cultural problem becomes apparent through the contrast of the hyper-futuristic amusement setting of the *Fair* and the conservative single family houses, serially produced in the mobile building factory.

The discussion poles within the discourse of modernism put many architects —particularly in the first decades of the twentieth century—into mediating positions between technological progress and conservative values. Rudolf Schwarz, for example, understood "series" as an essential characteristic of technology and contrasted it with the uniqueness of an organism. After the Second World War the architectural protagonists aligned the goals and values of modernism anew. The potential to make buildings with methods of industrial production implied for many architects the demand to rationalize this production in an architectural sense. In the 1960s cybernetics became the guiding science and subsequently the spread of systems theory virtually forced architecture to widen its understanding of structures. On the other hand, some architects considered building systems to be synonym with the economy's and the state's centralistic power. This

means that High Modernism's discussion of what constitutes architecture had to be recapitulated: Is architecture—from a single building to an urban plan—the organization of a system or an artistic act?
Series, understood as the fundamental characteristic of industrial production, have been replaced by the current production of non-standard series and unique copies made by 3D-printers. But the end of uniform series does not stand for the end of systems and structures as fundamental forms in architectural thinking. In a time in which the socio-cultural importance of seriality has been replaced by the parallelism of data streams, systems and structures gain new relevance, for example, real time data exchange and the quantification of social aspects in data streams. With real time processes and datafication the questions of the space-generating power of data and data control become eminently important for architecture.

Data, Control, Space

The management of social and environmental data streams (Brian Cody, Katia Gasparini) is today's accepted method par excellence to reach the new socio-economic goal of sustainability. It is the legitimation and pivot point of the current *smart city* discourse. It has been questioned since the 1980s as to whether sustainability in architecture will be mastered through high-tech or low-tech design. After the emergence of new technologies that process space-relevant data streams, this discourse has been transformed into the discourse on the so-called "smart architecture." Teams of architects and engineers design systems meant to manage complex performances of structures, thus reviving the desire of modernism to understand buildings as organisms.

As a second phenomenon, datafication of architecture is discussed as a technical means for human communication. Media façades and urban screens change the manner of architectural representation. At the same time they put to test the primary task of buildings: communication or shelter? When designing with these technologies the classical question of representation and ornament is expanded by the presentation modes of fast image changes. However, applying changing images to urban scale surfaces raises a problem: architecture provides the surface for the images, but can not influence the media contents of continuously changing images. Since these contents are subordinated under the global data streams and the media industry's economic interests, new uncontrollable urban spaces occur that compete with traditional urban structures.

The concern that datafication kills architectonic space is contrasted by the statement that datafication is a socio-cultural power that can be utilized for the creation of architectural space (Stefan Hajek, Kas Oosterhuis). Its conceptual key is that building parts and materials can be transformed to "informed components." By doing so, buildings become interfaces of

datafication of social and environmental aspects. Various data streams, fed by human behavior are condensed in networks between buildings, users, equipment, and the environment into a datafied *oikos*. The result is a kind of data-driven domesticity of the building user. The consequences for the planning of architecture are various, too. For example, the traditional organization of architecture projects is under immense pressure as the hierarchical model of the master workshop is transformed by interactive elements of gaming, leading to "collaborative design."

The concluding contributions reassure us—with a smile—of the relevance of our journal's title: cloud-cuckoo-land (Andrea Gleiniger, Sandra Schramke, Wolfgang Bock). The contemporaneous marketing-driven term "cloud" can be interpreted literally as well as metaphorically. The storage spaces of continuous datafication have an electro-physical place in server farms, which however remain unseen to users and dwellers. The quality of undetermined form and openness of social use has its counterpart in the quantity of the technical infrastructure's determined functions. As such the data-enriched global *oikos* stands at the threshold from the accepted world model of traditional narratives to a model of statistically calculated possibilities of conditions.

Authors

Ute Poerschke is a professor of architecture at the Pennsylvania State University and co-principal of *Friedrich Poerschke Zwink Architekten | Stadtplaner*. She is co-editor-in-chief of *Wolkenkuckucksheim | Cloud-Cuckoo-Land | Воздушный замок*. Her research in architectural theory focuses on architectural functionalism and the relationship between technology and architecture. In 2014 Ute Poerschke published her book *Funktionen und Formen. Architekturtheorie der Moderne (*Functions and Forms. Architectural Theory of Modernism*).*
www.fpz-architekten.de
stuckeman.psu.edu/arch/ute-poerschke

Oliver Schürer is an author, curator, editor, as well as senior scientist and interim director of the department of architectural theory at the Vienna University of Technology. He has worked on numerous research projects, experimental installations, lectures, events and international publications in his research areas of architecture as a socio-cultural field and of media and technology in architecture. Related to his current research topic of automatisms in architecture, Oliver Schürer published his book *Automatismen und Architektur. Medien, Obsessionen, Technologien* (Automatisms and Architecture. Media, Obsessions, Technologies).
www.a-theory.tuwien.ac.at/schuerer

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Recommended Citation

Poerschke, Ute / Schürer, Oliver: Theorizing Technology in Architecture and Urbanism. Editorial. In: Wolkenkuckucksheim, Internationale Zeitschrift zur Theorie der Architektur. Vol. 19, Issue 33, 2014, [pages], cloud-cuckoo.net/fileadmin/issues_en/issue_33/editorial_en.pdf [inquiry date].