

Distinguishing Technology and Architecture

With the increasing weight of technology in the built world, it becomes obvious that technology more than ever influences the architect's artistic and spatial considerations. There are stereotypical ways of how architects today react to this growing influence. When architects speak about their work, mainly three attitudes on how to deal with technology in architecture soon become apparent: *embracement*, *assimilation*, and *depreciation*.

The attitude of *embracing* technology is the easiest way to deal with the challenges of the ever-increasing importance of technology in building. By promoting technology, the architect can hope to raise attention with the client's otherwise economic, functional, and structural considerations. Addressing artistic issues as technical ones promises greater success than insisting on artistic integrity. But this embracement of technology always carries the danger of losing architecture altogether. The arrival of "Architectural Technology" as a teachable subject at universities endorses this tendency and suggests that architecture can at best support technology. On the other hand, it cannot be denied that the lure of technical progress has always seduced architects to force technical novelties into their designs, often by claiming that by doing so architecture itself would be transformed. This is why popular technical aspects of building like the virtualization of planning, new computer-aided design possibilities, ecological or energy issues are finding their way to the theoretical level so easily. When elevated to the level of architectural theory, this attitude results in a doctrine of justification that ultimately lends itself to the building industry in an ill-conceived attempt to maintain relevance for the profession of architecture while at the same time trying to attract commissions and research funds.

The danger of this approach lies in the blind appreciation of technology even though it might turn out to be at odds with the needs of the client and ultimately with the architect's task to create meaningful environments. This is not new, but it shows that the undeniable interdependence of industry and building is too often mistaken for an interdependence of technology and architecture. But justifying building-technology is not what should be of interest in theory of architecture.

The attitude to *assimilate* technology and architecture claims that technology is always part of architecture and therefore cannot or should not be differentiated from it. There are several dangers associated with this conviction. First of all it is ignoring history. Both technology and architecture, as we see them today, have evolved over time and are not unchangeable entities. Architecture as we see it today cannot be understood without the gradual establishment of the natural and the social sciences and the differentiation of their respective methods and concepts. Architecture as a subject today is fundamentally different from the 18th century or the time Vitruvius wrote his books on architecture.

Secondly this attitude inhibits progressive thinking, since it claims architecture and technology share an unbreakable common core. Applying mythical thinking, in which association by proximity replaces differentiation by logic, could lead to the conviction that technical issues become architectural ones simply because an architect has applied them. If there are no concepts of distinction between technology and architecture considering purpose and appearance, design decisions become arbitrary and ultimately submitted to fashion. Worst of all, it leads to unchecked elitist thinking and creates an echo chamber of institutionalized architectural dogmatism among peers.

The third way some architects deal with technology is by *depreciating* it. For them, technology is understood to be applied to architecture rather than being an integral part of it, no matter how much the importance of the role of technology in architecture is stressed. To those, technology always appears to be some kind of plumbing and therefore circumstantial to the assumed “essence” of architecture. In this case the complicated relation between technology and architecture is determined by the assessment that technology is seen as a material prerequisite to building but also that it constitutes a limiting factor to the possibilities of architectural expression that the architect needs to overcome or surrender to. This attitude is pragmatic and heroic at the same time. It highlights the trouble that architects face in the process of executing a design. There are countless stories of great architects having to face the material and legal consequences of their negligence of the technical implications of their designs. On the other hand, there are much fewer stories of technically proficient architects being great architects.

These stereotypical attitudes towards technology highlight the importance for architects to take a step back and reconsider the way they deal with technology. There is no denying that technology is as much part of every cultural discipline as it is a cultural discipline in itself and in this regard must be distinguished from other domains like architecture. In the following, I will concentrate on technology and architecture as cultural disciplines, where architecture is understood as a capability to create place by cultural means. This definition has been paraphrased by philosophers,

psychologists, and architectural theorists with the concept of “dwelling,” meaning the intentional and reflected use and creation of place through acts of symbolization.¹

When “Architecture comes from The Making of a Room,”² as the architect Louis Kahn titled one of his drawings (fig. 1) then there is always technology involved in the sense that the room has to be made somehow, but it suggests mainly that the described room has to have certain further qualities if it is supposed to be called architecture, most of all dealing with the question of how it contributes to the sense of place and time. This leads to the question whether there can be a genuinely “architectural” approach to technology, which at the same time clearly distances itself from the inherent technological approach. In other words, is it possible to distinguish epistemologically architecture and technology?

Trying to Distinguish Between Architecture and Technology

One might be tempted to distinguish between architecture and technology by simply separating the “tasks” and “subjects” with which these two have to deal. In the nineteenth century, the task of technology was to deal with the constructive and economical aspects of building, whereas architecture should provide for the aesthetic satisfaction of the customer. Consequentially, as subjects of these tasks, machinery and infrastructural works would not be considered architecture. In these obviously outdated examples, the notion of separating tasks and subjects is exhibited to an extreme, but the struggle is still alive in other fields of design such as agreeing on minimal planning and design requirements in commercial and industrial areas. On the other hand, the avant-garde view of early twentieth-century architects using and showing technological aspects and symbols in buildings led to the fiercest ideological battles in the development of modern architecture. This shows that setting demarcations for the applicability of technology in architecture and vice versa would be immediately challenged no matter how sophisticated the system of applicability could be conceived.

It would be futile to divide the solution of a spatial problem into a technological and an architectural one. Neither is a floor plan or a color concept purely architectural, as one may be tempted to assume, nor is a bridge construction purely technical. For most of the last two centuries it seemed that the increasing prevalence of technology in every field of human endeavor would render any applied-arts approach to architecture irrelevant. For the last few decades however, following the observation and critique of the proceeding alienation of the individual by technological progress, a new awareness and regard has set on for what Horkheimer and Adorno called the “dialectic of enlightenment.”³

1 The Philosopher Martin Heidegger has to be mentioned here with his work “Building, dwelling, thinking” (German: “Bauen, Wohnen, Denken” 1951, in: Ulrich Conrads, Peter Neitzke (ed.): Mensch und Raum (Braunschweig: Vieweg, 1998); the architectural theorist Christian Norberg-Schulz with his main work *Intentions in architecture* (Cambridge: MIT Press, 1997); as a psychologist J. J. Gibson: *The senses considered as perceptual system* (Boston: Houghton Mifflin, 1966); the architect Charles Moore with his theory of a “sense of dwelling” in *Body, Memory and architecture* (New Haven: Yale, 1977); and more recently Achim Hahn’s *Architekturtheorie* (Konstanz: UVK, 2008), in which he deduces that our understanding of architecture has developed from our experience of dwelling.

2 Louis Kahn, “Architecture comes From the Making of a Room,” drawing for the „City/2” Exhibition 1971, charcoal on yellow tracing paper, Philadelphia Museum of Art.

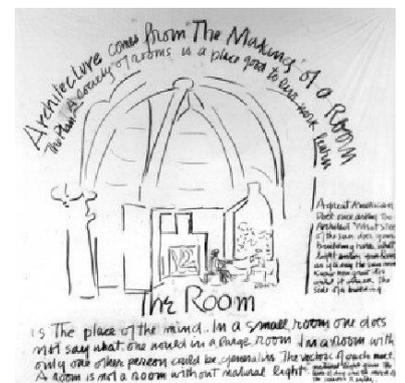


Fig. 1 Drawing by Louis Kahn.

3 Max Horkheimer, Theodor W. Adorno, *Dialektik der Aufklärung* (Frankfurt: Fischer, 1969).

The overwhelming success of technology that generates rewarding sensual experiences for its users is as much an example as are new construction techniques and materials that create a new experience of space in architecture. So is the home-button of the iPhone as much an architectural approach to technology as the Eiffel Tower was a technological approach to architecture? What then defines and separates architecture and technology today?

The first clue seems to lie in the everyday observation that architecture is perceived by the general public as an art form whereas technology is associated more with the functional aspects of life and therefore with the scientific world. Also, both architecture and technology differ from the associated disciplines of art and science in the way they communicate with the world—architecture lacking the spontaneity and purity of art, and technology lacking the clarity of science. Even more, architecture as well as technology has to come to terms with the notion that neither seems to be fully compatible with the field of knowledge or respectively to the realm of art and hence cannot be easily judged according to the standard of either.

If architecture and technology are at all to be understood as different cultural forms (which, for the sake of argument, should be taken as a given), we can approach these disciplines in a phenomenological and in a developmental way. Given the problems mentioned above concerning the description of what architecture and technology “are,” the phenomenological approach leads to circular reasoning about the things architecture and technology depict. Therefore I will temporarily suspend the question of how these disciplines could be defined “in their essence” and will concentrate on how they became to be what we at least think they are.

An Order of Making

The distinction between the two forms has developed in cultural history as a differing way of making things, not as a discovery of eternally unchangeable truths. Therefore, we have to research not an order of being but an order of making. By uncovering the development of cognition in the course of history, we can draw conclusions on how different cultural forms developed different methods and tools of cognition in the ongoing struggle for enlightenment. This struggle must be understood as an active *design process* to develop mental tools to better understand the world—and by doing so, paving a path to enlightenment in Kant’s definition as “man’s emergence from his self-imposed immaturity.”⁴ Further, I will base my arguments on the works of the philosopher Ernst Cassirer (1874-1945) who not only tied the history of enlightenment to the development of the problem of knowledge [“Erkenntnis”]⁵ but also developed from that a general theory of the culture-based nature of cognitive faculty. Based on this notion of the culture-dependant nature of processing and producing

⁴ Kant, Immanuel: An answer to the question: What is enlightenment ? (1784); www.theliterarylink.com/kant.html

⁵ Ernst Cassirer, *Das Erkenntnisproblem in der Philosophie und Wissenschaft in der neueren Zeit*, vol. 1, 2 (Hamburg: Meiner, 1999); vol. 3, 4 (Hamburg: Meiner, 2000).

knowledge, he also developed a general theory of the cultural disciplines, which, in his view, mirror the diverse but specific methods of generating knowledge.⁶

⁶ Ernst Cassirer, *Philosophie der symbolischen Formen*, 3 vol. (Hamburg: Meiner, 2001-2).

Architecture and technology are such disciplines, or “symbolic forms,” as Cassirer would call them, which are also representations of distinctive cognitive faculties. The use of the same term for a cultural discipline and the specific cognitive concepts that Cassirer employs may seem a little confusing at first, but it stresses the point that every cultural discipline is defined not so much by the subject it deals with but first and foremost by the unique way it creates and processes its topics. This could help us to come to a definition of what the basic properties of architecture and technology are in regards to their contribution to knowledge and cultural progress.

If we assume that the intentions and directions of architecture and technology are distinct from each other, there also must be a distinctive way of dealing with the challenges that are brought upon them from the outside world. It is therefore not so much about what architecture and technology contribute to life, it is about how they do it—and when and how they started doing it.

Separating Technology and Architecture

If we want to dig into the history of the relation between architecture and technology, we must be aware that even the concepts of these two terms only developed over time. The way we define architecture and technology today is informed by the background of the stage of our cultural progress and therefore can not be measured by the concepts of architecture and technology of the past. Still, we have to look into the past to understand the forces that triggered the separation and establishment of the terms that we use now.

There is no denying that every act of dwelling requires some technology—even in the most basic sense of handling material in a self-aware move to force it into an intended form. Architecture in its most basic description of “self aware dwelling” and technology in its most basic description as “intentional handling to attain form” almost instantly evoke the image of the “primordial hut,” the theoretical idea of a “first house” which Vitruvius describes as the source of not only architecture but also of technology and even civilization.⁷ For Vitruvius, the art of building and technology (as well as clockmaking) were departments of architecture.⁸ Technology and architecture as an “order of making” only became distinguished with the canonization of building rules and the calculation of load bearing. The architect that Vitruvius describes has not yet understood technology to be an external factor of architecture simply because there was neither an understanding of technology nor of architecture as distinct cultural

⁷ Vitruvius, *Ten Books on Architecture*; Project Gutenberg eBook, 2006, <http://www.gutenberg.org/files/20239/20239-h/29239-h.htm>; p. 38.

⁸ Vitruvius 2006, p.16.

disciplines. The architect as the master builder would incorporate both art and craft. Later in the development of what would then be called technology, tools became defined not by the person that made them or by the inherent “magic” of their capacity to overcome the limitations of the body and the challenges of the environment, but began to be understood by the task (function) that they could carry out.

Only when technology became detached from sensual perception did it gain a new quality. When still associated with tool-making and magical thinking, technology was, like building, a bodily experience. Technology, in its widest definition is, as the writer Max Eyth put it, “everything that gains physical form through human will.”⁹ In this regard, the object also reflected its creator, thus creating an animated bond between maker and object.

⁹ Max Eyth, *Lebendige Kräfte* (Berlin: Springer, 1908), p. 3.

From Substance to Function

With the introduction of tools, technology was set onto a different trajectory that eventually developed into a way of cognition of its own. The personal imprint of the producer diminished ever more in the history of technology, to the point that the work of technology became an endlessly reproducible object of the material world. Tools expanded the possibilities of production and, at the same time, not only helped categorize and classify the possible products, but also shaped language in its development towards logic and abstraction.

This hugely successful ability to “abstract” is a consequence of the willful removal of the concept of the individual and the aspects of body and expression that could not be further disseminated and categorized.

Cassirer describes this as the shift from the concept of “substance” to the concept of “function,” meaning concepts were not understood to refer to archetypes or ideals anymore but to certain common factors in regard to their measurable properties.¹⁰

¹⁰ Cassirer, Ernst: *Substanzbegriff und Funktionsbegriff*; Hamburg 2000.

In the process of the development of enlightenment, the arts and sciences therefore developed not as the uncovering and establishment of formerly unknown truths but more as a result of processing facts differently. The notion of an unchangeable entity with unchangeable properties gave way to seeing every entity as comprised of different aspects in different systems and therefore just as an example of these systems. This way the subject became operational or defined by its functions. It is due to this change in the approach to the subjects that new scientific disciplines would establish.

With this drive towards “efficiency” in the background, it became also obvious that not every subject could be handled the same way. While the

functional approach was applied with great success to the establishment of science and knowledge-based cultural fields, it became apparent that there were cultural forms that resisted that approach.

Sense Perception and Dwelling

As for technology, the material presence and the practical aspect of its description as an “order of making” keeps it from becoming purely relational in the way language and science are, but in its ability to venture into the relational world, it is easier to detach from individual experience and sense-based perception.

Because the aspect of sense-based processing and understanding can not be separated from the body, some cultural forms are less accessible to relational reasoning than others. Architecture and art are such cultural forms. The expressive element of experiencing architecture will always stay bound to sensual perception and sense-based reasoning, whereas technology only became its own symbolic form by partly detaching itself from the sense-based handicrafts.

While both architecture and technology require the active involvement of the recipient, in architecture the user stays involved in the designing process by living in it and with it, whereas in technology the design is designated to become an object of the material and scientific world.

The active involvement in the process of experiencing architecture has been described above as dwelling. Dwelling is how we deal with space, how we align our sensual and intellectual capacity in relation to the built world, and transform it by using symbols to establish a place that allows us to stay and abide.

Architecture, understood here as the cultural discipline of dwelling can not successfully develop a distance to its recipient. Since it cannot be avoided or ignored, it is a personal undertaking that cannot be rationalized or outsourced. It may have developed from the same “order of making” as technology did, but its cultural technique is based on and bound to sensual perception rather than to the objects it creates or the function it serves. Therefore, it has developed as a specific way of understanding and processing the world. It is inseparable from the senses and therefore largely inaccessible to purely relational thinking.

Two examples

To better understand the difference between architecture and technology in regards to dwelling, the exploration of examples could provide further



Fig. 2 Centre Pompidou by Rogers, Piano and Franchini.



Fig. 3 Aachen University Clinic by Weber and Brand.

11 I use this term according to Charles Moore's definition of a human capacity of creating base-orienting and haptic systems in the environment. See Bloomer, Kent C and Moore, Charles Willard, *Body, memory, and architecture* (New Haven: Yale University, 1977), p. 33.

insights. Two buildings will be compared in the following that have both been characterized as examples of “technical modernism”: the Aachen University Hospital (fig. 2) and the Centre Pompidou in Paris (fig. 3). Both exhibit similar technological signs and still they are worlds apart in terms of architecture.

In 1977, architects Rogers, Piano and Franchini built the Centre Pompidou in the historic downtown of Paris. It is visually dominated by the exhibition of technology. No matter how silly or inappropriate the building may be perceived, its creators made sure that technology as a topic of civilization was meaningfully displayed in the physical world, thus achieving the possibility of dwelling in the sense described above.

Almost at the same time, another building was designed with similar features. The Aachen University Clinic by architects Weber and Brand used the very same elements of technology, but this time as a demonstration of modern medical machinery. It is much bigger and located in an open and—at the time—almost rural environment.

One could argue that both buildings merely depict technology and therefore are not examples of the role that technology plays in architecture. But if one goes beyond that descriptive element that all architecture owns and regards depiction as a productive factor, it soon becomes obvious that descriptive elements also can be incorporated into the underlying “sense of dwelling.”¹¹ Regarding the two mentioned examples, it could even be argued that the building that showcases technology excessively is closer to architecture’s ability to evoke a “sense of dwelling” than the building that shows technology as necessity.

It also shows that “truth” in architecture is not as important as “meaning” in the sense that the display of technology has to serve the purpose of dwelling, not to serve a morally demanded notion of “appropriateness” with the “true” technical function.

Dwelling understood as meaningfully locating oneself in the given built environment or domain is achieved in the first example, given the backdrop of a historic city space, the inspiring dedication as a cultural institute and the playful arrangement of colorful building elements, but it is almost impossible in the second example. A hospital in an open field, where the exhibition of technology marginalises the recipients (who often come as patients) and leaves them with no chance to align with the built environment. In the core task that defines architecture, the Aachen clinic fails, because it is unable “to make sense” in every meaning of the word.

Conclusion

Architecture is the result and reflection of the human activity of meaningfully locating oneself in the physical and cultural world, whereas technology is the result and reflection of the will to improve or overcome bodily limitations. While the technical invention or discovery is just as much an act of creation as the design of a room, the goal and measure of success in technology is to integrate it into the sphere of science.

In these differing activities of architecture and technology lie the promise and the danger of technology in architecture. It does not go too far to deduct from that that technology is more aggressive than architecture, and it could be said that one of the tasks of architecture might well be the taming of technology and decision of how to apply it to the purposes of architecture. Seen under this perspective, technology in architecture is always subject to the expressive abilities and limitations of architecture. It is the image of technology that is transported in architecture, not technology itself. If the architect lets technology itself overtake the building task, he or she will risk the distinctiveness of architecture and will solely engineer. In this case, he or she will pass the burden on to the user, who might still mentally attach architectural qualities to the building.

If architecture comes from the making of a room—as Kahn had stated—or in a broader perspective, always owns an element of dwelling, it becomes obvious that personal experience cannot be separated from architecture. Sense perception and experience will never be sufficiently described in terms of measurability or rigid scientific terms. It needs a different terminology, a different set of cognitive tools to play its part in the universal strife for enlightenment that all symbolic forms compete to achieve.

Today, we are less inclined to see one cultural form as the source of another one, but still tend to divide cultural disciplines into fact-based and empirical ones. There is still a notion that architecture can change its constitution by use of technology. This has not changed much from the time when architecture promised to be the machinery of solving social and economical problems. I will argue that technology is neither an external factor nor a segment of a broader definition of architecture, but that both are quite distinct ways of perception and, if you will, also distinct ways of knowledge. Therefore the use of technology in architecture can only be descriptive and it must remain just one of several cultural topics that architecture deals with.

So, the only reason how it could be successfully argued that technology is becoming more important in architecture would be if technology contributed to a larger extent to the sense of dwelling as the core value of architecture. Of course, cultural forms can evolve and change over time. Every cultural formation is subjected to change in the course of cultural

progress. To find out if this is also happening in architecture with regard to technology, we would have to ask whether the way of understanding architecture is taken over by the methods of technology. This in turn would make the concept of architecture obsolete. But since no change in the perception of architecture nor in the common understanding of it is visible, I do not see how technology could diminish or improve architecture as a symbolic form.

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