The Social Construction of Sustainable Technics

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SOCIAL CONSTRUCTION, RISK, TECHNICS,

> *"We can hold in our minds the enormous benefits of a technological society, but we cannot so easily hold the ways it may have deprived us, because technique is ourselves."*[1]

In our work towards sustainability and beyond, this seemingly innocuous observation, that 'technique is ourselves,' often escapes us. In what follows, I suggest that architecture's technologically determined approach to its practices will ultimately limit that horizon of sustainable practices in architecture. When architecture views or relies upon building technology as a primary determinant, especially in regards to the problem of sustainability, in architecture and looks to new technologies to solve ecological problems, it perpetuates what is architecture's most blatant fiduciary irresponsibility: despite the fact that technology dominates our buildings, our practices, and our lives, architects know relatively little about its actual operations, effects, and behaviors. We often neglect to study the very technologies that we collectively grant such great momentum to in our receding horizon of practice. This condition is a product of a persistent, unexamined fallacy: architecture teaches its practices as technologically determined rather than socially constructed. In our adjacent disciplines, however, technology is understood as a variable of social practice and progress, not as a determinant. This is a fundamental problem of knowledge for architecture.

Purportedly a most rational endeavor, any technology is fraught with irrational historical constructions and legitimations that characterize its origins and use. The lack of theoretical and historical understanding of this substrate for technical practices frequently forces the hand of the architect, resulting in work that often perpetuates unsustainable practices. As momentum builds for sustainable practices in and outside of architecture, it is critical that architecture question its own assumptions about sustainability and the means to practice and achieve it. The aim is here is to discern and evaluate key aspects of our current technics that can help determine ultimately more sustainable paths for architecture. This paper articulates a few topics from with in architecture's technics that derive from the history and philosophy of technology that help frame a critical view of technical practices. These include the social construction of technology; the concept of risk; and what is described as the 'machine mentality.'

THE SOCIAL CONSTRUCTION OF TECHNOLOGY

Every technology is social before it becomes technical or physical. Technical development is first an expression of an immaterial need or desire, and only later becomes material and technical. As Gilles Deleuze stated, "Tools always presuppose a machine, and the machine is always social before it is technical. There is always a social machine which selects or assigns the technical elements used."[2] Social needs and desires predetermine any technical system in both rational and irrational ways. Much of whatnow appears as unsustainable in architecture was socially constructed and so will theiralternatives. To grasp the social construction of technology in architecture engenders deeper understandings of the historical

engenderment of our practices and allows us to strategically propose alternative practices. Rather than mere technical promises, this broader view of technology in architecture gains its efficacy from

a more deliberate engagement the multiple forces and factors that in the end determine architecture. In the history of technology, these multiple factors and forces of technology is known as technics. In the context of sustainability, architecture must advance deeper and more potent knowledge of our technics in order to ethically engage technical practices in the new century.

Technics refers to the assemblage of theories, techniques, and technologies that are embedded within a historical, social, economic, ecological and intellectual framework. [3] This is what Lewis Mumford called "The Machine."[4] "The Machine" represents not only the apparatus of technical production—its tools, machines, and networks—but also the agencies, histories, and habits of mind that comprise the substrate of technical production. Thus, to work on sustainability is to understand the problem of "The Machine." To understand the problem of "The Machine" is to study the social, economic, political, ecological and intellectual substrate of technical practices. Rather than perpetuate the determinist trap and perpetual rush towards new technologies, architecture should situate technics at the core of sustainability.

In his book, Technics and Civilization, Mumford developed a cogent summation of the parallel histories of technical and human development.[5] In it, he describes the habits of mind that presuppose technical developments. While any culture may develop a particular technology, Mumford suggests that only particular cultures and societies are predisposed to take full advantage of any technology. As such, technological development is not seen as an autonomous agent in culture. Mumford also articulates the agency of choice within technical practices. Acknowledging the social construction of architecture inevitably involves recognizing the role of choice in technical systems. All choices in a technical system are consequential and are thus open to reflection, doubt, and scrutiny as part of a technical practice. This is the agency of choice in technical systems. As Mumford stated, "The gains of technics are never registered automatically in society; they require equally adroit inventions and adaptations in politics…the machine itself makes no demands and holds out no promises: it is the human spirit that makes and keeps promises."6 Thus the social, cultural, economic and ecological needs and desires of a particular time forms the substrate from whence technologies emerge.

Architecture often takes the historical construction of this substrate for granted and this limits our approaches to sustainability. If we will understand technology at all, we will see it as an uninterrupted and ubiquitous practice. Any technology is anything but new. All technologies have a long period of social, cultural, and practical preparation. In our mythical paradigm of progress and technical mastery, terms such as "new" are merely rhetorical escalations that obfuscate the construction of technologies.

A canonical example is air conditioning. In architecture and the building industry, an excellent example is air conditioning. New building types, new engineering and architectural practices, new industries, new levels of energy consumption and new expectations for human comfort developed alongside the technics that surround air conditioning technology. They were likewise transformed by it. Air conditioning is characteristic of what Thomas P. Hughes describes as "technological momentum."[7] To fully understand the technological momentum of air conditioning, it is essential to articulate the social basis of this technology.

RISK

When a technology does become physical, it is not a benign reserve of technical solutions to social, ecological, or fabrication problems but rather produces its own risks and problems as a constitutive fact of that technology. All technologies contain some form of risk.[8]

Despite this fact, our culture often perceives technology as a reliable approach to sustainability. For many, new technology is the key to sustainable practices. Technologically determined practices impart the impression that its quantitative authority will guarantee a degree of sustainability. While technological developments often

amplify prospects for sustainability, we now know that we frequently do not cultivate proper technological management practices that would account for the constituent byproducts of a world characterized by small and large scale risk. Hazard increasingly characterizes our world, what Ulrich

Beck calls a 'Risk Society.'[9] In our age, the sources, sites, and effects of catastrophe approach the continental and the global.

Three Mile Island, Chernobyl, and Hurricane Katrina represent large-scale examples of failed technological management. In these cases, society unduly demands of technology what it cannot reliably provide: assured protection from hazard. Today, the difference between vibrant life and utter destruction of cities and regions increasingly becomes a problem of risk management based upon calculations of what is just less than hazardous. We manage the risks of technology with outmoded, nineteenth century methods that assign culpability to individuals and individual causes. However, broader personal, political, and industrial choices actually produce this context of risk, not individuals or individual technologies. The threats, sources and effects of thesehazards can no longer be isolated to any single culprit or cause. Risk now leaves no life, and no aspect of life, untouched. It is a critical component of our context for building.

In architecture, we practice a precarious asymmetry between technology's capabilities and its culpabilities. While technology may engender and accelerate progress, it will minimally manage its associated risks. Technology offers no automatic security or promise on its own. Without critical reflection, technology is as likely to engender, as it is to annihilate unintentionally, sustainable possibilities. In this view, sustainability is principally a subject of our technics. Presenting the culpabilities of technology alongside its capabilities would establish a more robust, albeit less euphoric, connection between technology and sustainability. Only the agency of personal and collective choices will determine sustainability. As David Noble stated, "There are no technological promises, only human ones, and social progress must not be reduced to, or confused with, mere technological progress."[10]

THE "MACHINE MENTALITY"

A third related but distinct aspect of our current approach to technologically determined approach to sustainability is know as the 'machine mentality.' David Noble describes the 'machine mentality' as the "understandable perhaps but nevertheless self-serving belief that whatever the problem, a machine is the solution. This manifests itself in a preference for, and the tireless promotion of, capital–intensive methods and in the widespread but mistaken belief that the more capital intensive the process of production, the higher the productivity."[11] This is at the core of the view that technologies will resolve social, ecological and economic problems. The pervasive 'machine mentality' in our culture engenders two primary problematic issues.

First, it obfuscates the social construction of technology and limits the agency of choice. If unsustainable practices are socially constructed rather than technologically determined, then the 'machine mentality' precludes sustainable solutions. The automatic, predetermined solution negates the role human choice will play in sustainable futures. A more nuanced, reflexive view of technology that expands the agency of choice, rather than diminishes it, is essential to the role of technology in future practices.

Second, there is an implication in the machine 'mentality' that as social, ecological, economic, and political problems escalate, technology must also escalate. The capital investment involved with such escalation carries its own forms of risk. The inverse is actually the more sustainable path. As technology de-escalates, it becomes more appropriate and more applicable throughout the first and third worlds. It also becomes more sustainable. High performance, low technology solutions typically are more durable, consume less, and are applicable equally in the first and third worlds. E.F. Schumacher' concept of intermediate technology provides an alternative to the embedded assumptions of the 'machine mentality,'

"The idea of intermediate technology does not imply simply a 'going back' in history to methods no out-dated, although systematic study of methods employed in the developed countries, say, a hundred years ago could indeed yield highly suggestive results. It is too often assumed that the achievement of western science, pure and applied, lies mainly in the apparatus and machinery that have been developed from it, and that a rejection of the apparatus and machinery would be tantamount to a rejection of science. This is an excessively superficial view. The real achievement lies in the accumulation of precise knowledge, and

this knowledge can be applied in a great variety of ways, of which the current application of modern industry is only one. The development of intermediate technology, therefore, means a genuine forward movement into new territory…"[12]

The conceptual shift regarding the role of technology that Noble and Schumacher describe can have a major as architectural practices become more sustainable. They prompt us to question some basic assumptions about sustainability in economic, political and ecological terms. The role technology will have in sustainability and beyond could be different than its role in the twentieth century that was characterized by this machine mentality.

CONCLUSION

"The greatest of all environmental powers is thought, and the usefulness of thought, the very reason for applying radical intelligence to our problems, is precisely that it dissolves what architecture has been made of to date: customary forms."[13]

Situating the otherwise technologically determined approaches to sustainability in their socially-constructed histories reveals the assumptions embedded in our current approaches to sustainability. If such technically determined false faiths blindly guide our idea of the good and productive, critical paths to sustainability will remain closed. We will know very little about the capabilities and culpabilities of technology in respect of sustainability if we only study a technology in terms of its technical performance in building production. It is incumbent upon architecture to question its own assumptions about technology to work towards sustainability and beyond. In doing so, in will inevitably more robustly engage the technics and context of the theories, techniques, and technologies that will eventually enable sustainable architecture practices. Our technics are pervasive; technology is by now our nature.

The three claims presented above contribute to our assumptions about sustainability. The claims are unreliable, ultimately, because they contain a limited conception of architecture's context and technics. As such, they limit the practices of sustainability and preclude approaches that would engage architects in the much larger dynamics of sustainability. The shift in approach suggested here is not more statistics, checklists, or technologies, but developing a deeper knowledge of architecture's actual context and technics. The most significant adjustments to the discourse and practice of sustainability will involve a shift to more literal and extensive conceptions of context and technics. Technics, as taught through the history and philosophy of technology, should be core content for architectural education. To teach architects about the systemic agencies of our technics and contexts already teaches a more potent understanding of sustainability. Architects need an operational understanding of the physical milieu of their work, expanded knowledge of material ecologies and effects, the capabilities and culpabilities of technology, the social basis of technology, the actual situation of architects in our industries, and a more vital conception of its time-imbued context. Only then will architecture practice what David Harvey has described as the "advancement of more socially just, politically emancipating and ecologically sane mix of spatio-temporal processes." [14]

ENDNOTES

1. George Grant. 'A Platitude' in Technology and Empire (Toronto: Anansi 1969) p 137-43.

2. Gilles Deleuze and Claire Parnet. Dialogues II (New York: Columbia University Press, 1987). p. 70.

3. This is a recurrent topic for Lewis Mumford and is the topic of his most comprehensive book on technics:

Technics and Civilization (New York: Harcourt, Brace & World, 1934).

4. Mumford, Technics and Civilization, Harcourt, Brace & World. p. 9-12

5. Mumford, Lewis. Technics and Civilization. Harcourt Brace & Company: New York, 1963.

6. Mumford, p 324.

7. Thomas P. Hughes. "Technological Momentum." In Merrit Roe Smith and Leo Marx, eds. Does

Technology Drive History? Cambridge, MA The MIT Press, 1994.

8. Beck, Ulrich. Risk Society: Towards a new Modernity. SAGE Publications, London. 1992.

9. Ulrich Beck, Ecological Politics in the Age of Risk. (Cambridge: Polity Press, 1995).

10. David F. Noble, Forces of Production: A Social History of Industrial Automation. Alfred A. Knopf:

New York, 1984. p. 351.

11. David F. Noble. "Statement of David F. Noble at Hearings on Industrial Sub-Committee of the 98th

U.S. Congress" in David F. Noble, Progress Without People. (Charles H. Kerr Publishing, Chiacgo,

1993.) p. 100.

12. E. F. Schumacher. Small is Beautiful: Economics as if People Mattered. (New York: Harper

Perennial, 1989.) p. 198

13. Reyner Banham, The Architecture of the Well Tempered Environment. The University of Chicago

Press. Chicago 1969.

14. David Harvey, 'The New Urbanism and the Communitarian Trap." Harvard Design Magazine:

Changing Cities. Number 1, Winter/Spring 1997.