

Questioning Technology through “The Question Concerning Technology”

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Architects, as people who experiment and use put science to use, are technologists and need to develop a philosophy on their relation to technology. It is useful for architects to refer to Heidegger's 1954 essay “The Question Concerning Technology”, which seeks to reveal the essence of technology, to begin to do this. According to this essay, the essence of technology is not technology itself, but examining technology is a way to uncover its essence. Thus the first part of the argument defines technology: “The manufacture and utilization of equipment, tools, and machines, the manufactured and used things themselves, and the needs and ends that they serve, all belong to what technology is. Technology itself is a contrivance, or in Latin, an *instrumentum*.” (Heidegger, 5) Since technology is employing means to pursue an end, an instrumentality, it obviously yields some type of an effect, otherwise, there would be no end. All effects must have a cause, which implies that technology is directly linked to causality.

At this point, Heidegger turns his questioning to an accepted philosophical definition of causality, which is defined by Aristotle's four causes:

For centuries philosophy has taught that there are four causes: (1) the *causa materialis*, the material, the matter out of which, for example, a silver chalice is made: (2) the *causa formalis*, the form, the shape into which the material enters: (3) the *causa finalis*, the end, for example, the sacrificial rite in relation to which the chalice required is determined as to its form and matter; (4) the *causa efficiens*, which brings about the effect that is the finished, actual chalice, in this instance, the silversmith. (6)

To understand Aristotle, Heidegger turns to the Greeks, to whom the Roman *causa* is called *aition*, and means, “that to which something else is indebted.” (7) That to which something else is indebted is responsible for that something else. Heidegger concludes that the four causes are actually ways of being responsible for something. To clarify his point, he again

uses the example of the silver chalice, but changes the wording. For example, the silver, the *causa materialis*, is not exactly a cause, but is “co-responsible for the chalice”. Furthermore, the chalice “is indebted to, i.e., owes thanks to, the silver...” (7) A similar two-way relationship is established between the form and the chalice and the function and the chalice. Then he disagrees with Aristotle: “the silversmith is not a *causa efficiens*.” (8) The relationship between the silversmith and the chalice is more complicated than that. The silversmith “considers carefully and gathers together the three [other] ways of being responsible and indebted.” (8) The silversmith does not act by rote, but consciously ponders his role in the creation of the chalice. He is aware of his responsibility of being a Being that “brings what presences into appearance”, or of revealing (10). In this way, Heidegger defines the essence of technology as a way of revealing and the job of the technologist as the one who reveals. The task of a silversmith is analogous to the task of an architect. Like the silversmith, the architect must carefully consider how to bring raw materials together to make a useful object. However, according to Heidegger, a technologist's task extends far beyond creating things.

It is significant to a technologist that Heidegger changed the word cause, which suggests a one-way relationship, to responsible, which suggests a two-way relationship. Part of the author's problem with the essence of modern technology is that it is a one-way method of seeing the world. The essence of technology, revealing, is positive; it brings objects to a Being's awareness. However, “the revealing that rules in modern technology is a challenging, which puts to nature the unreasonable demand that it supply energy that can be extracted and stored as such.” (14) Challenging is a mode of revealing that will not allow the object to be indebted since it no longer brings forth a unique presence, but rather forces the object to relate to the world as potential energy, otherwise known as standing-reserve. If all objects are conceived as energy, then they can be ordered in terms of how much energy they possess. Using a concept, like potential energy, that is invented by man and

exists outside of the object, allows man to measure and make comparisons between totally different things. "Thus when man, investigating, observing, ensnares nature as an area of his own conceiving, he has already been claimed by a way of revealing that challenges him to approach nature as an object of research, until even the object disappears into the objectlessness of standing-reserve." (19) The consequence of this way of thinking is that water is not water, but the source of hydraulic energy, and the sun is not a heavenly body, but the source of solar energy, and a person can calculate how much hydraulic energy equals a set amount of solar energy. Enframing is defined as the challenging that causes man to order nature as standing-reserve, and Enframing is the dangerous aspect of the essence of modern technology.

Enframing acts on thought as blinders act on vision. It narrows man's imagination so that man is unable to think outside of the dominant, logical, scientific epistemology. Heidegger wants to bring man's attention to the "monstrousness that reigns" when man becomes blind to the truth by suppressing an object's actual presence through his incessant need to understand all relationships in terms of standing-reserve. (16) The danger of Enframing attests itself in two ways:

As soon as what is unconcealed no longer concerns man even as object, but does so, rather, exclusively as standing-reserve, and man in the midst of objectlessness is nothing but the orderer of the standing-reserve, then he comes to the very brink of a precipitous fall; that is, he comes to the point where he himself will have to be taken as standing-reserve. Meanwhile man, precisely as the one so threatened, exalts himself to the posture of lord of the earth. In this way the impression comes to prevail that everything man encounters exists only insofar as it is his construct...In truth, however, precisely nowhere does man today any longer encounter himself, i.e., his essence. (26-27)

Heidegger distrusts modern technology because it conceals the larger truths of the universe. However, the objects made by modern technology are not inherently evil. Heidegger is not a Luddite; he simply objects to the blind use of science. He wants the maker to take responsibility for what he or she brings forth, and to acknowledge that there is something larger than human knowledge that is encountered in the world all around us. Instead of cloaking the natural in a human construct (like the idea of energy), man should let it speak. Ordering is a one-way operation; the boss speaks, but does not listen. A conversation is a two-way operation; man speaks and listens to nature's response. Man is not the boss. He must listen to those things outside of his making so that he can begin to understand and relate to this world.

Listening to the earth's logic is a large part of non-modern technologies. According to the Torah, the old testament, the

huts that the Jews used during their forty-year exile in the desert, sukkot, had coverings, *sekhakh*, that were made of vegetative material, such as tree branches or corn stalks. These roofs were designed in such a way that it provided some protection but also allowed the residents to be able to see the stars through it. The Torah is very specific about the need for a view to the sky; looking at the stars, the occupants are reminded that humans are deeply connected with the cycles of the earth. Many indigenous cultures, including Native Americans, construct sukkot-type structures. For the Navajo's the dwellings orientation was extremely important:

The hogan should have an entrance facing east...the doorway or opening should face east so the sun's rays of the morning can go directly into the inner part of the home. The sun carries thoughts, planning and materialistic things of value. It also carries materialistic things of necessity, variety of food, thinking and philosophy of every day life. (<http://www.vanderbilt.edu/snap/culture.html>)

The occupants of a sukkah or a hogan cannot ignore the sun, the direction of the wind, or the vagaries of the vegetation. While living in tents is neither desirable nor appropriate, there are lessons that can be learned from studying how the architects of these cultures build. Looking outside of Western culture is one method of overcoming Enframing.

Heidegger's boldness in correcting Aristotle not only allows him to further his search into the essence of technology, but also is another example of a method for overcoming Enframing: he questions his predecessor. Heidegger's method suggests that no man's thoughts should be considered too sacred to question. He destroys the aura that surrounds Aristotle by stating that, "the Aristotelian doctrine neither knows the cause that is named by this term [*causa efficiens*] nor uses a Greek word that would correspond to it." (Heidegger 8) His questioning of a philosophical giant can be seen as an example of how the average man needs to question modern technology rather than accepting it without examination. This questioning is mankind's saving power. Through his ability to think, man can escape from Enframing's deception:

The coming to presence of technology threatens revealing, threatens it with the possibility that all revealing will be consumed in ordering and that everything will present itself only in the unconcealedness of standing-reserve. Human activity can never directly counter this danger... but human reflection can ponder the fact that all saving power must be of a higher essence than what is endangered, though at the same time kindred to it. (33-34)

Thus it is the questioning of both our society's technological fascination and of the construction industry that allows an architect to use native technologies. One of the most recent examples of how questioning technology rather than embracing

technology led architects and engineers to return to older construction techniques is the Navajo Nation demonstration project, sponsored by the U.S. Department of Energy, the U.S. Department of Housing and Urban Development, and the Navajo Nation. As with many poor communities, a large number of residents of the Navajo Nation cannot afford and do not want the typical American builder home. The researchers into the community's housing crisis found that conventional building methods rely on unsustainable materials like rigid insulation for their structural and climatic performance. After analyzing the way Navajo's dwell and evaluating the current home designs on the reservation, the researchers recommended utilizing straw-bale wall construction. Their 1995 report states the following:

Straw-bale building is a practical and perhaps under utilized construction method. Initiated in the United States at the turn of the century, straw-bale building is showing new merit in today's marketplace. Walls of straw, easily constructed and structurally sound, promise to take some of the pressure off of limited forest resources. Straw is a viable building alternative, plentiful and inexpensive. Straw-bale buildings boast super-insulated walls (R-50), simple construction, low costs, and the conversion of an agricultural byproduct into a valued building material. Properly constructed and maintained, the straw-bale walls, stucco exterior and plaster interior remain waterproof, fire resistant, and pest free. Because only limited skill is required, a community house-raising effort can build most of a straw-bale house in a single day. (U.S. Department of Energy, Energy Efficiency and Renewable Energy, <http://www.eere.energy.gov/EE/strawhouse/house-of-straw.html>).

The researchers found that a native technology worked better with the Navajo's world-view and offered a better solution to their problems than a solution that relied on newer materials or production methods. They questioned the logic of the typical light-frame timber construction methods, which is structured according to the principle that materials - nails, wood - are cheap while labor is expensive. Navajo's place a great importance on preserving the earth, the spiritual mother, and on preserving the closeness of blood relations. Traditional rituals, such as the ones associated with house-raising, are used to reaffirm the goodness of the earth and to strengthen familial and community bonds (<http://waltonfeed.com/peoples/navajo/culture.html>). Only by not "enframing", only by questioning, could the researchers conceive that straw-bale is the sensible answer in this situation. The ancient art of straw-bale construction revealed an advancement in the construction of affordable, sustainable single-family dwellings.

Thatching is another native technology used in both sukkot and certain Navajo building types that is enjoying renewed interest in first world nations such as Germany. While the cost of thatch

is less expensive than the same surface area of slate and the support structure is simpler to build than that needed for tile, thatch, like straw-bale, involves a high input of manual labor. On the other hand, thatch has many advantages over other roofing materials. For example, since reed bundles are poor conductors of heat, *thatched roofs make excellent natural "air-conditioning plants"*, retaining warmth under the roof in winter, while keeping heat out in summer. The reed required for thatching is obtained locally or from reed plantations that have been established in countries such as Turkey and South Africa, which puts money into economies that need it. Plus, thatch can potentially last longer than some conventional roofing techniques: according to Manfred Arp, "a flawlessly crafted thatched roof lasts 30 to 40 years, but needs regular upkeep" (http://www.hamburg-messe.de/presse/presse_DachWand/DW3_Reet_englisch.htm). Finally, because of its long history, many builders are familiar with making such a roof and many cultures identify with the aesthetics of thatch.

This material's increased popularity has led CSIR Building and Construction Technology to publish a guide to thatching and create a new coating that make thatch more resistant to fire, which is its main weakness. This scientifically enhanced thatch is the perfect material to help rebuild the homes in East Timor, where almost 80% of the building stock was recently destroyed. The national psychological need the comfort of homes like the ones they lost, and these were thatched structures. Yet they also need the assurance that their new homes will not burn as easily since guerillas are still torching entire communities. This is where CSIR's marriage of a native technology with an emerging technology highlights how questioning can lead to culturally sensitive applications of first world technology to ancient construction methods. There was no need to throw out thatch because it was old or because it burns. Rather the technologists learned from history, resisted the temptation to try to change entire cultures, and did not tinker with thatch's inherent environmental, climatological, and cultural intelligence. They simply made a hardier material that still takes advantage of thatch's structural logic.

For Heidegger, true technologists are the people who thoughtfully make all of their choices. They consider what is available, who they are building for, and the global consequences of their choices. But even a philosopher is apt to get caught in the trap of Enframing. Thus, Heidegger advocates the contemplation of art as a route to the "saving power." (Heidegger 34) Art is akin to the essence of technology in that it is also a way of revealing, but it is only effective if "reflection on art, for its part, does not shut its eyes to the constellation of truth after which we are *questioning*." (35) Man needs modern technology for all of the good that it brings, but he also must be able to step outside of the technological and remember that he exists in a world that is larger than him. If art allows man to step outside of the scientific mode of knowing long enough to question modern technology's meaning, then it can serve the role that Heidegger

formulates for it. If art simply becomes a new all-encompassing way of seeing the world, then it becomes just as dangerous as Enframing.

Is there any danger in Heidegger's argument for responsible makers? Responsible makers construct buildings that are well sited, use passive techniques to control the temperature, and renewable resources because they know that the earth is not standing reserve. They think of using straw-bale and thatch rather than trendier technologies to solve their problems. It is the responsible makers that are attempting to use scientific research to create non-toxic carpets and insulation. Yet, responsible makers can have the tunnel vision too. The architects who concentrate only on sustainable technologies are apt to forget about the importance of art and culture. Architecture, being half a science and half an art, is a field that could teach both scientists and artists the importance of creative thinking. As Heidegger writes, "questioning is the piety of thought," and when man stops questioning, he becomes another unthinking object, trapped by the demands of others. While questioning may not reveal truths, it does grant man his

freedom: he is free to ask, to contemplate, and to take responsibilities for his decisions. (35)

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