

The Ontological Performance of Sustainable Design

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INTRODUCTION

In recent years, conversations concerning sustainable design have focused almost exclusively on questions of resource conservation and energy efficiency within the built environment. Practitioners and scholars alike remain dedicated to the idea that the utilization of sustainable design methodologies merely serves to create a structure that consumes fewer resources and operates more efficiently than a conventional structure. In other words, many assume sustainable design methodologies lead to an improvement in the quantitative performance of a building – nothing more. Such an understanding has led many architects and scholars to place a strong emphasis on the quantitative performance of sustainable design solutions, and even formal systems such as the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Rating System rely heavily on quantitative performance standards in an attempt to define and measure the impact sustainable design methodologies have on the built environment.

While understandings of sustainable design that focus on quantitative or technological performance are not inaccurate, I do believe they present an incomplete account of the impact sustainable design has (or might have) on our lives. It is my goal to explore the non-quantitative impacts of sustainable design and to thereby provide a fuller and perhaps more meaningful understanding of sustainable design. Ultimately, I intend to shift the discussion away from quantitative or technological performance and toward what I refer to as the *ontological performance* of sustainable design solutions.

In speaking of ontological performance, I am referring to a structure's ability to reveal the fundamental characteristics of human being or existence. In terms of the ontological performance of sustainable design, I intend to focus on the potential that sustainable design methodologies have to reveal our basic relation to and place within the natural world, our situatedness both in and across time, and our basic human mortality. By focusing on the ways in which sustainable design solutions might begin to speak to us of these basic human characteristics, I hope to demonstrate that, through sustainable design, our structures have the potential to provide us with a clearer or at least a more immediate understanding of the fundamental nature of human existence.

However, let me emphasize the fact that I do not intend to provide a new definition of sustainable design. I only wish to *expand* current definitions or understandings to include a broader range of issues. I want to begin a discussion on how sustainable design can inform more than just the ways in which we use natural resources. In this sense, my approach is focused less on what sustainable design *is* and more on what sustainable design might *become* or what fundamental aspects of the human condition it might *reveal*. In order to begin answering questions such as these, we must be willing to abandon the current limitations that have been placed on sustainable design and allow ourselves to explore a wider range of possibilities. We must be willing to imagine what architecture might become and to investigate how the structures we design might begin to speak to us of ourselves and our place in this world.

THEORETICAL FOUNDATIONS

In *The Ethical Function of Architecture*, Karsten Harries identifies a key link between architecture and human being, or dwelling. He suggests that, if architecture is to serve dwelling – that is, if architecture is to result in any meaningful sense of self or human rootedness in the world – it must speak to us of our own mortality.¹ Echoing Heidegger's belief that being is, fundamentally, a being toward death, Harries argues that the structures we build must acknowledge death if they are to have any relevance in our lives. Noting the significance of acknowledging death, Harries continues:

As long as we remain unable to make our peace with the fact that we grow older and sooner or later must die, remain unable to make our peace with the passage of time, we also will be unable to make our peace with all that binds us to time – with our bodies, for example, with our sexuality, and with the setting of the sun, with the coming of winter, and with the earth, which so often withholds its gifts.²

As this passage suggests, any failure to acknowledge the passing of time, aging, and death makes it difficult for us to acquire an accurate understanding of self and the self's place in the world. According to Juhani Pallasmaa, contemporary architecture often discourages us from acknowledging or confronting any of these issues. Instead, Pallasmaa writes:

Buildings of this technological age usually deliberately aim at ageless perfection, and they do not incorporate the dimension of time, or the unavoidable and mentally significant processes of aging. This fear of the traces of wear and age is related to our fear of death.³

Due to the continuation of such Modernist tendencies, today's built environment continues to discourage any recognition of our place in time and our mortal being, effectively preventing us from confronting one of the fundamental characteristics of human being.

I contend, however, that sustainable design has the potential to change this, to result in structures that encourage us to confront our temporal being and mortality, and to thereby reach a fuller understanding of what it is to exist in the world.

At its core, sustainable design is concerned with issues of time and human mortality. The entire sustainability movement has emerged as a direct re-

sponse to increasing levels of environmental degradation that pose a significant threat to human life, both now and in the future. In this sense, sustainable design ideology can be seen to contain an implicit recognition of temporal existence and human mortality, for it acknowledges the continual need to protect the resources and ecosystems that sustain human life over time. Yet, we seldom speak of the ways in which sustainable design is connected to our place in time or our mortality. Thomas Fisher writes:

Our survival as a species seems so remote a possibility that we rarely raise it, even as we have set in motion what scientists now call the 'sixth extinction,' in which, because of our fragmentation of habitat, pollution of water, and alteration of the atmosphere, we will likely see the loss of as many as half of the species currently alive over the next 40 years. And yet we remain among the most vulnerable of them all.⁴

In light of such refusals to acknowledge human fragility and mortality, it seems reasonable to suggest that the buildings we design must not only have positive environmental impacts, but they must also reveal the intimate connection we have to the natural environment and speak to us of our basic human mortality.

Ultimately, I believe sustainable design has the potential to result in structures that do just that. By privileging the utilization of natural energy systems, the incorporation of recycled or reused materials, and the performance of a structure over time, sustainable design methodologies lead to the creation of structures that emphasize our connection to the natural world and our existence in and across time (and therefore our imminent death as well). Due to the inherent consideration it gives to such issues, sustainable design is uniquely positioned to present us with a clearer understanding of what it is to exist in the world. In other words, sustainable design solutions not only have the potential to achieve high levels of energy performance, they also have the distinct potential to achieve a significant level of ontological performance. It is to particular examples of this sort of performance that I will now turn my attention.

ONTOLOGICAL PERFORMANCES

Body and Memory

It may be important to note that the ontological performance of sustainable design does not result from

its ability to produce an new or original experience. Instead, the ontological performance of sustainable design is derived from its ability to reveal things already understood but often overlooked or simply unacknowledged. In other words, sustainable design reveals the nature of being by bringing events, circumstances, or objects that are typically overlooked into clearer focus, allowing us to confront issues of time and mortality that we often fail to consider.

As Juhani Pallasmaa suggests, "Architecture does not invent meaning; it can move us only if it is capable of touching something already buried deep in our embodied memories."⁵ This passage alludes to the way in which certain experiences may remind us of our physical presence and temporal being, aspects of existence that, although buried deep in our unconscious understanding of self, are rarely confronted directly. Furthermore, it suggests that architecture must engage these unconscious memories if it is to gain significance and to play a role in defining or informing our sense of self.

Dalibor Vesely further explicates this idea of embodied memories and the importance they have for our understanding of self. He writes, "If we acknowledge the impossibility of reducing the sphere of embodiment to the isolated human body or brain, it then becomes clear that memory is – in its very essence – situational."⁶ Vesely continues:

In other words, no amount of isolated data or 'memories' can restore or simulate the concreteness of the human situation. This brings us to the conclusion that memory does not contain 'memories'; that its seat is not in the brain, which only contributes to the articulation of remembered experiences and to our awareness of the past; that it is mostly latent; and that it is an intrinsic dimension of our world and our ability to understand.⁷

With this statement, Vesely suggests that our situation, or our actual experience of a particular space, may determine our ability to access particular "memories" or to understand certain features of the world.

This leads to the implication that the built environment has the potential to function as a reservoir of latent memories or understandings. In this way, our experience of and interaction with architectural space has the potential to provide us with a fuller, more immediate understanding of what it is to exist in the world. In other words, architectural spaces

and structures have the potential to achieve a level of ontological performance.

Environmental Connectivity

As Pallasmaa points out, "Architecture is our primary instrument in relating us with space and time, and giving these dimensions a human measure."⁸ Although all architecture can reveal our relation to time, I believe sustainable design solutions have the potential to demonstrate humanity's relation to time while also reinforcing our relation to the natural world.

This ability stems from sustainable design's tendency to privilege the use of passive or active solar design strategies. Passive strategies involve an inherent understanding of a structure's orientation in space and its relation to the movements of the sun throughout a single day as well as an entire year. Similarly, active solar strategies or technologies have the ability to respond to changing environmental conditions and thereby provide a physical measure of the sun's movement. Similar to the way in which leaves of a tree record or give measure to the wind, active solar shading systems give measure to the sun's movement and the subtle changes in environmental conditions. In both cases, the structure's ability to record or give measure to the daily and seasonal movement of the sun serves to remind users of the temporal nature of their existence as well as their dependence upon natural energy systems for comfort and, more importantly, survival. By making these frequently overlooked processes of the natural world more visible and more integral to daily activities, sustainable design solutions serve to remind us of our connection to the natural world and reaffirm the temporal nature of our existence.

Consider, for example, Jean Nouvel's Arab World Institute project in Paris, France. The southern façade of the building utilizes a series of motorized diaphragms that are designed to function as solar apertures, adjusting in size in response to changing lighting conditions. Although somewhat dated and not entirely effectively, the system nevertheless represents the type of active solar shading strategy that sustainable design solutions might employ. Furthermore, this type of responsive technology creates an opportunity for the structure to give measure to changing environmental conditions, making it easier for users to understand the build-

ing's as well as their own relation to the natural environment and the passing of time.

Currently, researchers are developing similar façade technologies at the Center for Architecture Science and Ecology in New York. More specifically, these researchers are seeking to develop façade systems that exhibit a higher level of performative response to environmental conditions and that have the ability to precisely adjust to the continuously shifting geometries and intensities of the sun's energy. By incorporating adaptive technological systems into these façade assemblies, CASE researchers hope to create a façade that saves energy. As a result, however, these façade systems will also be able to provide a continual index of environmental lighting conditions. Furthermore, this ability to give a physical presence to the dynamic, temporal nature of environmental forces might allow the building to begin to speak to us of our place in the natural world and our relation to time.

In the end, since sustainable design solutions are more likely to utilize active solar systems in an attempt to conserve energy, it seems reasonable to suggest that they are also more likely to provide us with an opportunity to confront our rootedness in the natural world and our dependence upon its energy systems. By giving material presence to environmental forces and the passing of time, these sustainable systems have the potential to remind us that we exist within a complex network of ever-changing natural systems and that this condition is a fundamental aspect of human being.

Traces of Life In Time

In addition to the incorporation of natural energy systems and solar technologies, materiality represents another way in which sustainable design solutions might begin to have an impact on how we understand the nature of human being. In writing about the relationship between architectural materiality and its relation to time, Leatherbarrow states:

The finishes and forms specified in design and realized in construction are undone in life, but the result is not only deformation, not only negative. Although wear and tear result in subtraction, they also allow for a significant sort of addition. Over time and through use, architectural settings accrue legibility as they chronicle the patterns of life they accommodate. Time does not pass in architecture, it accumulates.⁹

Instead of viewing the passing of time as a negative influence, Leatherbarrow embraces the impacts of weathering and daily use. To him, the accumulation of various marks on a material surface is simply a way in which architecture is able to record and give further expression to the events that occur within it.

Peter Zumthor expresses a similar understanding of architectural materiality and its ability to record human action. Zumthor writes:

I am convinced that a good building must be capable of absorbing the traces of human life and thus of taking on a specific richness. Naturally, in this context I think of the patina of age on materials, of innumerable small scratches on surfaces, of varnish that has grown dull and brittle, and of edges polished by use. But when I close my eyes and try to forget both these physical traces and my own first associations, what remains is a different impression, a deeper feeling—a consciousness of time passing and an awareness of the human lives that have been acted out in these places.¹⁰

As Zumthor suggests, the traces that accumulate on the surface of a material can begin to give us a sense of our place in time as well as our relation to other lives that have already been played out.

Heidegger understood the significance of material traces of human action as well. He felt that such marks serve as reminders of our presence; that they provide an opportunity for us to remember or to confront our own being. Perhaps most importantly, however, Heidegger believed that noticing traces of human action recorded on architectural materials allows us to locate ourselves within a time span much larger than that of a single human life.¹¹ In other words, Heidegger felt that recognition of material traces allow us to appreciate the brevity of our own being and to confront the inescapable nature of our death. In the end, this sort of recognition allows us to form a fuller or more immediate understanding of self and to gain a clearer understanding of what it is to exist in the world.

Although this sort of expressive materiality is certainly not unique to the field of sustainable design – as almost any material, whether classified as sustainable or not, can absorb traces of human action – I would like to suggest that sustainable design solutions are particularly well suited to the absorption of traces of human life. This is due, in large part, to the fact that sustainable design privileges the use of natural, reused, and recycled materials.

According to Pallasmaa, natural materials “express their age and history, as well as the story of their origins and their history of human use,” and tend to do so more explicitly than synthetic or composite materials.¹² While this claim can certainly be debated, it seems reasonable to conclude that natural materials are receptive to both environmental and human influence. Similarly, reused materials that are incorporated into sustainable design solutions have been exposed to human action prior to their most recent use, leaving them more likely to already contain traces that record the process of aging and give expression to the lives or environments they were previously exposed to. Finally, recycled materials also represent a unique condition, for recycled materials have the potential to literally re-present formerly recognizable materials or objects in entirely new forms. Crushed glass countertop surfaces, for example, present what was once a glass bottle or similar object as a fractured collection of glass chips. Although seemingly insignificant, this process of re-presentation reveals the temporal existence of particular objects and begins to speak to us of the closed loop resource systems that sustainable design seeks to achieve. In each of these cases, materiality serves as a means of engaging our memories and encouraging the recognition of the passing of time and, although somewhat indirectly, our temporal and inevitably mortal nature.

As discussed earlier, the presence of marks, scuffs, or stains on the surface of an architectural material has the potential to serve as a reminder of our place in time; to speak to us of the lives that came before us, the fleeting nature of the life we are now living, and the lives that will leave their own marks in the future. Since sustainable design encourages the use of materials that tend to exhibit a higher quantity of such traces, sustainable design solutions are especially well suited to engage in an ontological performance – i.e. to remind us of our mortality and to emphasize the fact that a finite, temporal existence is a fundamental characteristic of human being.

Ultimately, whether through the use of particular materiality or solar design strategies, sustainable design has the ability to affect our awareness of self and focus our attention on some of the fundamental characteristics of what it is to exist in the world. Yet, further consideration should be given to additional ways in which sustainable design might influence our understanding of the nature of human

existence. With this in mind, I will present a possible avenue of further study in the following section.

CONCLUSION

As I hope to have demonstrated, the ontological performance of sustainable design emerges as a result of its inherent relation to issues of time and temporality. By encouraging a recognition of the temporal nature of our existence and the cyclical nature of many natural systems, sustainable design informs our sense of self and encourages a recognition of our fundamental nature of being. Yet, it also begins to establish a unique understanding of beauty that has the potential to reshape the way we design.

In his own discussion of beauty, Harries identifies two separate types of beauty according to their particular relation to time. He writes:

[B]esides the beauty of timeless forms there is beauty inseparably linked to time. Think of shifting cloud patterns, or of the wake of a boat, or of a soap bubble that grows ever more beautiful as it comes closer to bursting: as we attempt to hold on to some particular form floating on its surface, it dissolves, gives way to another. How different is the beauty of these elusive colors and patterns from the beauty of a cut diamond.¹³

This passage makes a distinction between the permanent beauty we so often seek to achieve in architectural design and the fluid, ephemeral beauty we find throughout the natural world. Leatherbarrow makes a similar distinction within architecture itself, noting the difference between the time of the façade and the time of materials. He writes:

There seem to be two orders of time in architectural experience: the time of the façade, a changeless duration of the same *through* time, and there is the time of the site, interiors, and materials, a time of change, continuous alteration and difference.¹⁴

Together, these passages reveal a tension between the permanent nature of architecture and the impermanent or ephemeral nature of natural phenomena, including that of human experience and existence. What I would like to suggest in these final paragraphs is that sustainable design, through its engagement with issues of time and natural temporality, encourages the dissolution of such tensions, thereby setting the stage for the development of what one might describe as an *ephemeral architecture*.

In referring to the emergence of an ephemeral architecture, I am speaking of a way of designing and building that actively seeks to incorporate elements of dynamic movement and constant fluctuation into the structure, envelope, and material systems of the built environment. While this remains an admittedly broad and abstract goal, I believe it represents an important step in any attempt to design structures that reflect the fundamental nature of human existence.

In considering this idea of an ephemeral architecture, I am repeatedly drawn to the work of American artist or sculptor Janet Echelman. Although not necessarily an architectural example, Echelman's work provides a compelling example of a construction that actively responds to natural forces and acquires aesthetic intrigue through its temporal nature. To me, structures such as these represent a potential starting point for further investigations into the development of a more amorphous, ephemeral architecture.

Ultimately, I believe sustainable design represents the first step toward developing this sort of ephemeral architecture – one that brings to light the fundamental nature of human existence by privileging impermanence, exhibiting a responsiveness to both human and environmental influence, and promoting a conception of beauty that is inseparably linked to time.

ENDNOTES

- 1 Karsten Harries, *The Ethical Function of Architecture* (Cambridge: MIT Press, 1997), 252.
- 2 Ibid., 160.
- 3 Juhani Pallasmaa, *The Eyes of the Skin: Architecture and the Senses* (Chichester: John Wiley & Sons, 2005), 32.
- 4 Thomas Fisher, foreword to *New Directions in Sustainable Design*, ed. by Adrian Parr and Michael Zaretsky (New York: Routledge, 2011), xv.
- 5 Juhani Pallasmaa, *The Thinking Hand: Existential and Embodied Wisdom in Architecture* (Chichester: John Wiley & Sons, 2009), 136.
- 6 Dalibor Vesely, *Architecture in the Age of Divided Representation: The Question of Creativity in the Shadow of Production* (Cambridge, MA: MIT Press, 2004), 99.
- 7 Ibid., 99.
- 8 Juhani Pallasmaa, *The Eyes of the Skin: Architecture and the Senses* (Chichester: John Wiley & Sons, 2005), 17.
- 9 David Leatherbarrow, *Architecture Oriented Otherwise* (New York: Princeton Architectural Press, 2009), 82.
- 10 Peter Zumthor, *Thinking Architecture* (Boston:

Birkhauser, 2006), 26.

11 Adam Sharr, *Heidegger for Architects* (New York, Routledge, 2007), 7-8.

12 Juhani Pallasmaa, *The Eyes of the Skin: Architecture and the Senses* (Chichester: John Wiley & Sons, 2005), 31.

13 Karsten Harries, *The Ethical Function of Architecture* (Cambridge: MIT Press, 1997), 241.

14 David Leatherbarrow, *The Roots of Architectural Invention: Site, Enclosure, Materials* (New York, NY: Cambridge University Press, 1993), 218.