

Irrational Management: Designing for and Against Nature

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This paper uses the case study of a Salmon Cannon to describe a non-binary nature, one neither fully natural nor fully generated by human intervention, extracted from managerial approaches towards the environment. Through a close reading of the Salmon Cannon, we suggest that rational approaches to the control and management of nature can produce irrational, absurd, or even comical outcomes and can point towards opportunities for design that engage the friction produced within Anthropocenic conditions. If an emerging environmental consciousness in the 1960s and 1970s generated corresponding architectural outcomes, and if we are currently in the middle of an equally significant transformation of environmental conditions, what might the strategies be for a resulting design response? Within this space, we develop initial points and approaches to design with and for these entangled states.

Within the context of this conference's prompt regarding crossings between the proximate and remote, this paper makes a claim for a hybrid state amidst extreme conditions. By concentrating on a single case study of a madcap fish transport device called a Salmon Cannon, the paper is an effort to understand, first, why this device is compelling and, second, what insights its particular state might offer into questions of nature, infrastructure, management, and design. As a human-made construction that acts as a conduit for fish over and across other human-made constructions, the Salmon Cannon points to the complexities of understanding nature at a moment of mounting environmental anxiety and precarity. We suggest that the Salmon Cannon is symptomatic of a new "Third Nature," borrowing a term from anthropologist Anna Tsing, a condition that accepts entanglement, contamination, and compromise as a given. First we establish theoretical guideposts for understanding nature more generally and some of its connections to the built environment. Then through a close reading of the Salmon Cannon, we discuss how it points to the limits of a technocratic management of nature and

typical approaches to sustainability while also offering new, possibly counterintuitive, approaches to design that embrace the absurd and irrational.

In *Nature's Metropolis*, William Cronon describes the dynamic between two conceptions of nature, First and Second Nature. Cronon writes, "A kind of second nature designed by people and improved toward human ends gradually emerged to top the original landscape that nature—"first nature"—had created as such an inconvenient jumble."¹ For the purposes of this paper, one might consider First Nature as that which is wild or untouched and Second Nature as that which has extractable or translatable value. That is, First Nature is understood as is an obstacle to overcome, while Second Nature is a resource to be managed. Examples of First Natures might include Albert Bierstadt's rendition of sublime wilderness in his paintings of the Yosemite Valley from the 1860's, while crop irrigation circles inscribed within the grid of the Land Ordinance of 1785 might reflect a Second Nature.

To these conceptions, one can also connect narratives of progress and faith in both the abundance of the landscape and of the unproblematic extraction of material. While the Second Natures that resulted in farms and feedlots had their own astonishing physical manifestations, it was in large infrastructural works that the triumphant project of "harnessing" nature is most visible. Infrastructure projects, particularly those public works that began in the 1930s and 1940s, such as the Grand Coulee Dam in Washington state, are entrenched in such progress narratives. Located along the Columbia River, the Grand Coulee Dam was a mega-project completed in 1944 and touted in promotional material at the time as, "...man's biggest job. It is four times larger than the Great Pyramid, and as high as the Washington Monument."² Appealing to a pioneer ethic and mentality of overcoming obstacles through infrastructure, the advertisement describes the coming economic prosperity with the introduction of new hydroelectric power and the subsequent transformation of vacant land into industrial farmland.

At the heels of the triumphant and monumental presentation of large public works, such as the Grand Coulee Dam, a growing anxiety around the consequences of these interventions was emerging. No longer was nature a source of endless abundance but instead



Figure 1: Entangled Imaginaries: Fish traveling upstream are inventoried in a mechanical enclosure before human handlers manually guide them into the induction tube of the Salmon Cannon.

its fragility was becoming more apparent. This was also coupled with an emerging idea of a “whole earth” in which Second Nature was becoming planetary. At the same time, the consequences of a century and a half of industrialization were also becoming difficult to ignore and, as Felicity Scott points out, “environmental management” became an increasingly significant part of political awareness and policy making, though often still in pursuit of power consolidation.³

In this context, Buckminster Fuller and Shoji Sadao’s iconic “Dome over Manhattan” from 1960 serves as a fitting emblem of an architectural response to these issues. A management project as much as an architectural one, the dome asserts that total control of all inputs and outputs is the key for survival. As Scott describes it, the dome is an “image of defense against an increasingly hostile environment, from which it was simultaneously derived.”⁴ The dome suggests a closed world in which the material enclosure is a key feature in the production of a binary condition. Even though the dome is a response to the expanding awareness of an increasingly toxic planet, it nonetheless reasserts the same habits of mind responsible for creating that condition and highlights a similar techno-scientific approach to the environment.

As such, “Dome Over Manhattan” is representative of one design response to an emerging environmental crisis of the 1960s. If the response then was to reinforce the primary boundary and enclosure

conditions of architecture through self-containment, what kinds of responses do we find today? How does our current crisis of resources appear in the built environment? One approach is to bring us back to the dam as a site of investigation: for its infrastructural history and mythology; for its implications within a growing awareness and anxiety about its negative impacts on larger ecological systems; but also for the ways that it intersects with multiple life-forms. As an example of the changing perceptions and requirements of infrastructure, it became clear that beyond their destruction of a river’s natural morphologies, including varied flows and falls, the dams were disruptive at an instinctual level for numerous species who depended on the river as part of their lifecycle. Anadromous salmon, for example, navigate from the ocean upstream to small tributaries to spawn. The dams pose an obvious obstacle to this process and were devastating in their effects on domestic fisheries, even if fish ladders were incorporated into many of them. The fish ladder, an abstracted version of the waterfall, relieves human anxiety by enrolling fish in its logic. Similar to the water moving downstream that passes through the dam’s turbines, the passage of fish upstream is also absorbed into the Second Nature infrastructural regime.

The Salmon Cannon, like the fish ladder, is a type of wildlife corridor designed to assist salmon in returning to their native spawning grounds. Developed in 2011 in Bellevue, Washington by a company called Whooshh Innovations, the Salmon Cannon originated from a device that uses vacuum technology to gently transport perishable agricultural products, such as tree fruits, from the picking site to a central storage facility. According to Whooshh Innovations, in comparison to the fish ladder, the Salmon Cannon is cheaper, more

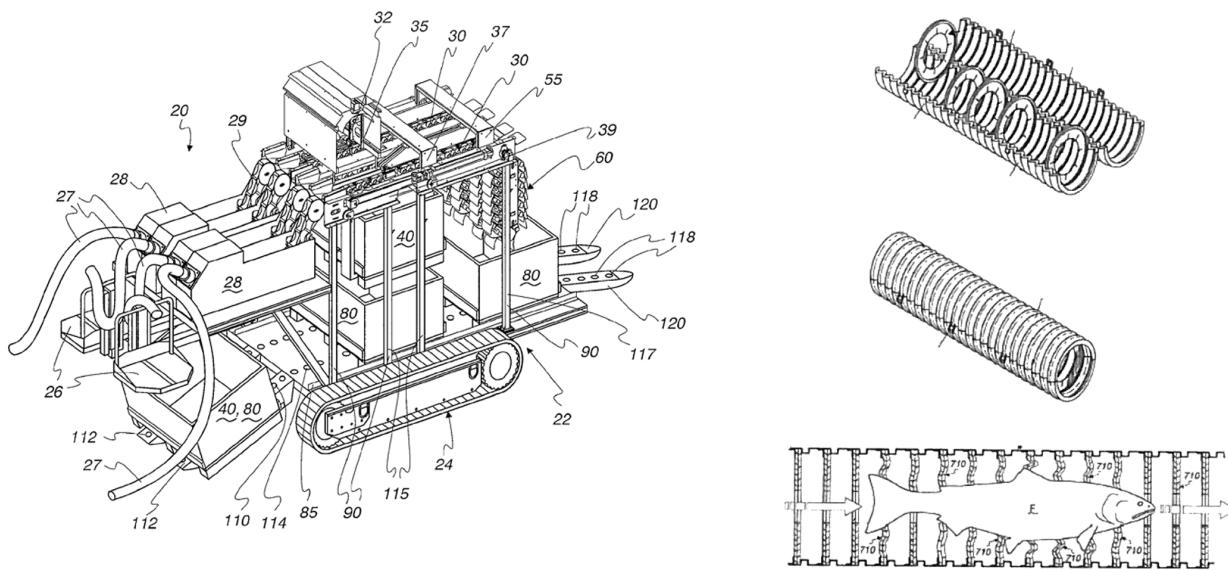


Figure 2: Objectsystems: Whoosh Innovations initially developed a semi-automated system capable of picking the delicate fruit without damaging it (left). Using the same technology, the Salmon Cannon (right) is part of a larger bio-infrastructure system in that includes rivers, tubes, vacuum pumps, and migrating fish.

transportable and flexible, uses less water, and is more efficient and reliable.⁵ Using the same vacuum technology, the Salmon Cannon is a flexible tube supported by cable rigging that “whooshes” salmon to their intended destination. The gentle pressure differential sucks up the salmon at a rate of up to 40 fish per minute, hurls them through the tube at roughly 15-30 feet per second, lifts them to heights upwards of 300 feet, across lengths of almost 650 feet, and then finally deposits them in the water on the other side.⁶ A “volitional” entry system to the Salmon Cannon relies on the instincts of the fish to swim upstream through an artificially induced waterfall and into a rubber transport tube.

Rather than seeing the infrastructure of the dam as a dominant, stable, and absolute condition that absorbs and renders normal the process of fish passage, the Salmon Cannon suggests a more contingent and entangled condition. A human-made bridge for a human-made obstacle designed to help another species survive in spite of the problems human interventions have caused. This teleological drive characteristic of such a technocratic approach is a familiar one of capitalist narratives of progress. But, as Anna Tsing argues in *The Mushroom at the End of the World*, “The problem is that progress stopped making sense.”⁷ Indeed, part of our interest in the Salmon Cannon is in its hare-brained qualities—that a completely rational process of earnest problem solving could yield such a surprising and comical device. Tsing makes a case for a shift in thinking around the ways we look at nature and suggests that by accepting

the conditions of our environment as compromised as a starting point, new and hopeful possibilities emerge. In other words, instead of seeking to recover a pure First Nature, one can be open to consideration of new forms that might exist. She considers this a “Third Nature” and describes it as, “that which manages to live despite capitalism.”⁸

This “Third Nature” is one of assemblage and entanglement and a productive category, we believe, for analyzing the Salmon Cannon in greater detail in pursuit of possible design approaches. Out of this investigation of the Salmon Cannon, we identify a series of preliminary ideas that serve as guiding principles for some of our own work both in terms of design, pedagogy and as new avenues of research that suggest non-binary ways of thinking about possibilities for design.

ENTANGLED IMAGINARIES

The Salmon Cannon is an encounter between human, fish and machine that fosters intertwined dependence. Moments of encounter occur throughout the day as humans manage the fish moving through the system. Whoosh Innovation touts that one of the benefits of its unique fish conveyance systems is that every fish that enters the system can be automatically counted.⁹ In the non-volitional version of the Cannon, handlers can also collect scales from the fish or attach sensors to track migration patterns and life cycles. Part of these efforts are to monitor the fish populations but another is to collect data that supports Whooshh’s success. By making population counting part of workers’ duties, the strange and comical condition of loading a fish into a 300-foot pneumatic tube becomes banal and routine. Moreover, the system demands maintenance and attendance of human stewards—and even levels of care in which the



Figure 3: Asynchronous Milieus: The Salmon Cannon creates two simultaneous conditions. The interior (above) is designed to simulate a continuous and familiar environment for the fish passing through it. At the same time, the exterior (below) makes no effort to disguise its artifice.

health of the machine and the health of the fish it is transporting become intertwined.

OBJECTSYSTEM

As an artifact, the Salmon Cannon can be read as both an object and as part of a larger system. On a nation-wide level, it is linked to the infrastructural network of over 80,000 man-made waterway obstructions in the United States over five feet high, including dams for electricity generation, crop irrigation, and drinking water.¹⁰ The Salmon Cannon is also a kind of wildlife corridor infrastructure. In the case of Michael Van Valkenburgh Associates' ARC Wildlife Bridge project for Denver, Colorado, the intervention is designed to be camouflaged and create minimal disturbance for both human drivers or wildlife, crossing over or under it.¹¹ The Salmon Cannon, on the other hand, is active both in how it engages the fish and by how it augments their abilities even temporarily. By intention or not, the Cannon is not designed to disappear, rather its clunky mechanical actions are explicit and continuously demonstrated in its workings.

ASYNCHRONOUS MILIEUS

From the exterior, there is no effort to camouflage the Salmon Cannon as anything but the mechanical construction that it is. In other words, exterior simulation of a perceived nature is not the goal. However, Whooshh Innovations speaks at length about their efforts to simulate a fish friendly habitat. The "volitional" entry

imitates an upstream environment and the transport tube incorporates an interior sliminess and mistiness to protect the scales, eyes and overall health of the fish during their passage, something that might not be so different from going over a waterfall.¹² This presents a kind of inversion in which an interior simulated condition is designed to produce experiential continuity for one species while exposing its artifice to another.

ABSURDITY VIA INTENSIFICATION

While perhaps an unintentional effect, the Salmon Cannon embraces its artifice and by doing so accentuates some of its aesthetic qualities that are compelling. Simultaneously mechanical and organic, rigid and convulsive, durable and delicate, the Salmon Cannon makes no claims for permanence and in fact signals its provisional qualities as a selling point, making it possible to install it in a more temporary way. The apparatus, in contrast to both fish and landscape, is estranged from its context in a productive way that demands attention. In a recent feasibility test for Chinook salmon transport, Whooshh tests the limits of the system by attenuating it to over 1100 feet upon precarious wooden struts, stretching the system to absurd limits.¹³

It is within this unintended absurdity that opens up possibilities, both in terms of aesthetics and methods. In Sam Jacob's close reading of Chuck Jones's *Wile E. Coyote and Road Runner* cartoons he writes, "For all of its theatricality, obvious setups, and stylized aesthetic, absurdity is still concerned with a form of truth...It constructs mirrors rather than solutions, fun house mirrors at that, whose distortions show us the world in exaggerated form. Absurdity implicitly admits to the limits of a situation and articulates the tension between the desire to transcend and the failure of its ambition... Though architecture often operates within the realm of absurdity, it rarely recognizes its own absurdity."¹⁴

COUNTERINTUITIVE FRICTIONS

What would happen if architecture were to recognize its own absurdity? The Salmon Cannon offers a few initial responses to this question in the way that it calls attention to the situation it is trying to overcome. Rather than naturalizing the process, it demonstrates a version of infrastructure that is an assemblage of scales, materials, systems, and lifeforms. It takes a system initially designed for picking fruit and grafts it onto another materials handling problem, itself a kind of absurd gesture. The problem it seeks to address through a supple and provisional infrastructure points towards the monumental and rigid infrastructures of an earlier era.

This paper offers the Salmon Cannon not as a model to emulate uncritically, but rather one whose unintentional effects reveal intensified conditions and heightened frictions. It is a system in its adolescence that will eventually become formalized and normalized into a regime of resource management. One can see in this certain denialist tendencies that extend a status quo by normalizing conditions through techniques of amelioration. The Salmon Cannon in its current state, however, is arrested at a moment of



Figure 4: Absurdity via Intensification: In a feasibility study, Whooshh tests the limits of the Salmon Cannon extending its run to over 1000 feet, almost twice its typical distance.



Figure 5: Counterintuitive Frictions: The Salmon Cannon brings multiple systems into adjacency without naturalizing the process it establishes.

development, in which one has a glimpse into the possibilities of an infrastructural approach that would resist naturalization. It opens up toward new categories that would both preserve a state of awareness and welcome new arts of noticing along with material, spatial and experiential qualities that offer aesthetic pleasure and provoke imagination, even, we might hope an expanded imagination about our own entanglements with the world.

ENDNOTES

1. William Cronon, *Nature's Metropolis: Chicago and the Great West* (New York: W.W. Norton & Company, 1991), 56.
2. Antique postcard.
3. Felicity Scott, *Outlaw Territories: Environments of Insecurity/Architectures of Counterinsurgency* (New York: Zone Books, 2016), 246.
4. Felicity Scott, *Architecture or Techno-utopia: Politics After Modernism* (Cambridge, MA: MIT Press, 2007), 232.
5. "Fish Passage," Whooshh Innovations, accessed September 30, 2017, <https://www.whooshh.com/benefits4.html>.
6. "Quick Reference Guide," Whooshh Innovations, accessed September 30, 2017, <https://www.whooshh.com/quick-reference-and-spec-sheet1.html>.
7. Anna Tsing, *The Mushroom at the End of the World* (Princeton: Princeton University Press, 2015), 25.
8. Tsing, *The Mushroom at the End of the World*, viii.
9. "Competitive Advantage - Passage/Rescue," Whooshh Innovations, accessed September 30, 2017, <https://www.whooshh.com/competitive-comparisoin.html>.
10. "Fish Cannon," 99% Invisible, accessed September 24, 2017, <https://99percentinvisible.org/episode/fish-cannon/>
11. "ARC Wildlife Bridge," Michael Van Valkenburgh Associates, accessed September 24, 2017, <http://www.mvvainc.com/project.php?id=89>.
12. "Whooshh: Fish Friendly," YouTube, https://www.youtube.com/watch?time_continue=5&v=L5fwT0er9Nk.
13. "Whooshh: 1,100 ft Live Chinook Transport Test," YouTube, https://www.youtube.com/watch?time_continue=147&v=1AUJD37DLLc.
14. Sam Jacob, "ACME," *Log 22* (Spring/Summer 2011): 82.