



Technofossil art piece by Jared Farmer

Design and Deep Entanglements

Insights

- Our material and immaterial impact beyond the present is key.
- We need to move from temporalities of hype to temporalities of nature.
- Inspiration can be taken from how Indigenous designers approach problem-solving, aesthetics, and ethics in design.
- We need to listen to those prevented from expressing their experiences in the intersection of past, present, and future(s).

In 2014, professor of environmental history Jared Farmer created an amateur art piece, what he calls a *technofossil*, using a BlackBerry Curve 8300, a smartphone released in 2007. Very aptly, Farmer notes that:

[O]n the surface, my art piece satirizes the relationship—verbal and material—between consumer capitalism and biological extinction. Advertisers have brazenly co-opted the language of ecology and evolution to naturalize planned obsolescence, extending the 1960s idea of “product life cycle.” Products must evolve—or die. Technology journalists create listicles of endangered gadgets; they warn us that even adaptable ones

can go extinct if they live within innovation-starved ecosystems; they refer to outmoded devices as dinosaurs or living fossils [1].

Consequently, Farmer proposes that such imaginings of what future fossils may look like can help us come to grips (quite literally) with the ecological impacts and anthropogenic effects that industrialization and consumer culture have produced. While these effects are becoming increasingly visible (e.g., through the thawing of glaciers and polar ice, the desertification of soils, and vegetation fires), phenomena such as climate change and biodiversity loss can also remain intangible and escape our

imagination simply due to their ubiquity, immenseness, and “subtle violence.” Farmer’s technofossil exists as a material reminder of such changes. In the context of this article, it also points to how *design*—as the practice and process of envisioning, planning, and creating objects, interactive systems, buildings, vehicles, and so on—needs to consider how products and technologies represent *amalgamations of both time and raw materials*. Consequently, we argue that, as potential fossils, designed objects have an opportunity to acknowledge their *deeply entangled* responsibilities in relation to future generations, both human and more than human.

DEEP TIME AND DEEP ENTANGLEMENT

Coined in 1981 by John McPhee, and having a much longer history within the geological sciences [2], the term *deep time* has gained contemporary analytical traction, recently within the humanities. In essence, deep time is used to address the vast timescales of geological events. As such, it is concerned with long-term geological processes, taking into account material developments and impacts over literally astronomical periods of time. These timescales are notoriously difficult to grasp, so one way that deep time has been made more understandable is through its relationship to the present. This may seem counterintuitive, since deep time was arguably conceptualized precisely as a way to separate geological timescales from the fragmented temporality that pervades our everyday lives. Nevertheless, the “deep present” can be seen as an analytical perspective on our current times that emphasizes the interplay of long-term, ancient geological events with short-termist, late-modern capitalism and technosolutionism. So, while the temporalities of deep time go well beyond the existence of humans, it is also distinctly

connected to the Anthropocene, the proposed geological time period in which human activities have begun to have a notable negative impact on Earth’s climate and ecosystems.

Here, anthropologist Richard Irvine [3] makes an interesting and convincing argument that geological time and biographical time intersect in the fabric of everyday life. In many ways, we have become dependent on the extraction of a range of natural materials—materials that have come into existence over long, often irreproducible geological time spans and conditions. Not only are these resources then used up at a quicker rate than they regenerate but they have also been notoriously hard to recycle, thus becoming part of a growing amount of unusable, sometimes hazardous waste. As such, our actions and technologies today make an impact into the future; Irvine consequently proposes that we have a distinct biographical relation to the deep time of geological processes. By extending our temporal perspectives, we can counteract the presentism that too often characterizes the present. In the words of Irvine, “A grounded understanding of the relationship between human life and the time span of geological formation allows us to recognize the disembedding nature of our extraction from deep time—a present fixation that severs humanity from the material conditions of its existence” [3].

Stacy Alaimo’s notion of transcorporeality [4] can aid us even further here. Alaimo argues that the human subject (and body) is never a disconnected autonomous object but always already entangled in the various environmental flows that surround it:

As the material self cannot be disentangled from networks that are simultaneously economic, political, cultural, scientific, and substantial, what was once the ostensibly bounded human subject finds herself in a swirling landscape of uncertainty where practices and actions

that were once not even remotely ethical or political matters suddenly become the very stuff of the crises at hand [4].

The fundamental but also critical insight is consequently that all beings—not only humans—are deeply entangled with, and even permeated by, the material world they jointly exist in. In this perspective, distinct ontological boundaries become diffused; the mapping of such productive interactions across deep and more-than-human timescales is the foundation of transcorporeal politics and ethics. We argue that such interactions should also be accounted for in transcorporeal design—design that positions subjects not as detached, disembodied, and moot “users,” but rather as defined by, dependent on, and enmeshed with the biological, technological, economic, social, and political environment, across wider timescales. For the purposes of this article, we also want to specifically highlight our inherently technical relation to the “swirling landscape of uncertainty,” where design culture and material culture mediate and shape our relationships to our ontological reality. That is, our human relation to ecology and geology is inherently technical, and various technologies constantly operate to integrate or affiliate human and more-than-human actors in various ways. Design, as a practice, is thus shaping the fundamental technological condition by which we experience the world, transforming subjectivities, agencies, and ontological boundaries. One important question then becomes: How can design take these deep entanglements into consideration?

DEEP ENTANGLEMENTS AND DESIGN

Through a focus on deep entanglements, we want to show how capitalism, biopower, and transcorporeality need to be considered together. A pertinent example relating to design is planned obsolescence, a design practice that is highly detrimental to the ethics of deep entanglements. Put simply, planned obsolescence rests on the idea that a continuous discarding of products is necessary for consumption to be maintained, which is, of course, profoundly unsustainable. In its emphasis on short-term economic goals,

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planned obsolescence also contributes to long-term geological and ecological drawbacks—often geographically, economically, and temporally separated from the design and consumption of the initial product. Much e-waste is transported to distant locations and burned, releasing toxic airborne fumes and particles—which eventually end up in human bodies and natural environments, effectively targeting already vulnerable people and places more than the privileged. The recycling of electronic parts is thus moved to countries with low requirements for protective equipment and cheap labor that generate higher profits. This demonstrates how a cynical production system distributes these ultramodern by-products in an attempt to separate its toxic impacts, in both temporal and geographical terms. Nevertheless, toxins from discarded digital artifacts accumulate in human adipose tissue, not primarily through inhalation but through eaten and digested fish. In fact, all bodies, human and animal, are more or less already toxic [4]. As such, the products that we use and discard at increasing rates effectively demonstrate a deeply entangled, ubiquitous design and manufacturing process that exploits natural as well as human resources in an untenable fashion.

A design solution is basically a model that describes certain end-product specifications, and that will be used to manufacture the product and to conduct quality assessments. As such, there is a risk that the design solution is separated in time and space from the (consequences of the) finished product, such as the raw materials used and the long-term impacts the product may have. Echoing the introductory quote by Farmer, products are seen as having operational agency, material impact, and cultural importance only during their increasingly diminishing hype cycle. Concepts such as deep time and transcorporeality thereby become ways to retie potentially severed material and immaterial knots between the past, present, and future. This focus on intragenerational ethics and deep entanglements is yet another way to think about specific designs and products as knots where temporal threads of various registers are tied together. These threads and knots exist around us all the time, but through the “sciences of the artificial” (including

design) we are also deliberately tying them to achieve certain goals. This perspective illustrates how artifacts come into existence as always already deeply entangled, transcorporeal, and intra-active [5].

This article opened with a vignette describing an artificial technofossil [1], the key insight being that such objects can direct attention to the interplay between late capitalism and ecological crisis. Sy Taffel illustrates how such fossils, defined as “technical objects whose material properties denote that they will become embedded within the planet’s stratigraphic record” [6], urge us to think about the media technologies we design as future material inscriptions on Earth’s geological record, and thereby as always already more-than-human designs.

ECOTECHNOLOGICAL DESIGN SENSIBILITIES

Having moved through these brief but also more analytical discussions and concepts relating to deep entanglements, the questions become: *How can we design to escape presentism, and how can we take deep entanglements, transcorporeality, and intra-action into consideration more concretely when designing?* We will propose a number of ecotechnological design sensibilities that will serve as initial mindsets that can help designers and researchers address and analyze different timescales and classes of wicked problems. As we have touched upon, design is not only about the making of futures; it is also foundational to our understanding of, and relation to, the past. The present moment, and our presence in the world, is mediated through designed technologies; as such, design is crucial to epistemology—how we know the world. Thinking about our deep entanglements, and our impact beyond the present, is therefore key.

From disruption to duration. This sensibility argues that we need to move from temporalities of hype (and short-term “disruption”) to temporalities of nature (long-term duration). Such a move is notoriously difficult, but we think that design has an important part to play in connecting the mundanity of everyday life and deep time. Computer technologies, specifically, have

long-term impacts that need to be seriously considered. There are separations in time between our acts in the present and deep time that may seem hard to bridge, but what a focus on deep entanglements illustrates is the *ethical proximity* that exists between past, present, and future. We are integral parts of the ecological environment—it is us—so disconnecting design from such an entanglement would do a great disservice to future generations. Both designers and “users” could be further urged to reflect on the connections between different timescales and the long-term consequences of lifestyles and materialities. What future fossils and future remains could be the result of specific designs? Deep entanglement provides a conceptual possibility for designers, as well as researchers, to confront difficult and “deep problems” from multiple and complementary timescales. Considering how man-made objects are an important aspect of the Anthropocene challenge, design, as a general practice, has a potent opportunity and agency to engage with, and even foster, an awareness of multiple timescale contingencies in both research and design and their more encompassing ethical, social, political, and ecological consequences.

Specific Indigenous ontologies/Anthropocene imaginaries. Building on Matthew Adams [7], we also think that design can benefit from considering what he calls specific Indigenous ontologies. Adams outlines a number of tools for addressing Indigenous ontologies and multispecies relations, and while a sensitivity to several of these issues has been part of design ethnography for a long time, Adams provides an important reminder to move beyond common notions of users and stakeholders and think more broadly but also more specifically about such relations. Adopted for design, the sensibilities are: accounting for location, accounting for Indigenous place-thought, and accounting for the ongoing colonial imperatives of design. Accounting for location means to be accountable for how design is not value-neutral or disinterested. Rather, all design is embedded in its context of production, which includes the designers’ locations in time, space,

body, historical and societal power relations, and so on [8]. Importantly, it also extends to technologies and techniques—the machines, devices, theories, and conceptual frameworks that are at the designers’ disposal. Situated knowledges, both of designers and of other stakeholders, is important to analyze and self-reflect on in the context of production, as is the role played by various norms as part of the design process. This means an extension from the logic of design to the ecological context of design. For Adams, this extends to accounting for Indigenous place-thought—referring to specific Indigenous imaginaries of the Anthropocene—and the embeddedness of the human in its overall environment. Such theoretical understandings of how the world is ontologically and ethically connected to the actions of humans can challenge contemporary capitalist models at their very core. Finally, accounting for the ongoing colonial imperative of design means taking Indigenous design seriously. Design, as a practice, has been extensively researched in Western contexts. As such, there is arguably a great opportunity for design overall to be more inspired by how Indigenous designers approach problem-solving, aesthetics, and the ethics of design.

Promoting epistemic justice. For this proposed sensibility, we lean on Miranda Fricker [9] and her term *epistemic injustice*. For Fricker, the focus is on the conditions and content of knowledge production—what is recognized as knowledge (and not) and whose “life-worlds” become visible and reproduced. Fricker conceptualizes this in two forms: *testimonial injustice* and *hermeneutical injustice*. Testimonial injustice occurs when a person is not considered credible based on prejudice. It is quite easy to imagine situations when this has happened or is happening; for example, when a person’s experience is not recognized because of her skin color or gender, when a person’s sexual history affects her credibility as a rape victim, or when a person’s skin color or ethnicity prevents her from being believed by the police. Hermeneutical injustice occurs due to differences in common interpretive resources, which

in turn prevent a person from creating meaningful experiences and putting them in a comprehensible context. Fricker elaborates on this:

Let us say that when there is unequal hermeneutical participation with respect to some significant area(s) of social experience, members of the disadvantaged group are hermeneutically marginalized. The notion of marginalization is a moral-political one indicating subordination and exclusion from some practice that would have value for the participant [9].

This raises questions about how a marginalized or biased access to knowledge production can also limit social agency. By drawing on Fricker’s work at the intersection of epistemology and ethics, but widening epistemic injustice to envelope the concept of deep entanglement, ecotechnological sensibility can be regarded as the sensibilities to listen to those who are prevented from giving meaning to their experiences and see those who are not regarded as reliable witnesses in the intersection of past, present, and future(s).

CONCLUSION

While design is certainly more than problem-solving, activities such as conceiving, analyzing, and devising solutions are unquestionably also important parts of design processes. Based on discussions and examples of such concepts as technofossils, deep time, and transcorporeality, we have argued in this article that design solutions run a risk of detaching themselves from deep entanglements of materiality and temporality. A growing body of work is showing that the long-term “political and ecological agency” of digital technologies should not be underestimated. New classes of wicked problems emerge with the current ecological crisis, demanding transcorporeal and intra-actional design practices. Like all of us, design must be ready to accept the moral responsibility that human-technological coagency entails. We are now effectively agents in natural selection—a process that has historically required eons, and that has only been disrupted by naturally occurring events. The insights brought by deep time and deep entanglements

are a way to connect the past, the present, and the future. In the face of an ecological crisis, consisting of a multitude of interconnected variables, design needs to take on board holistic, systemic, and historicizing notions, putting technologies in direct connection with our atmosphere, biosphere, hydrosphere, and geosphere.

ENDNOTES

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✎ **Jörgen Rahm-Skågeby** has a Ph.D. in informatics and is an associate professor of media studies at Stockholm University. His research is focused on human-machine communication and media archaeology. It covers topics such as imagined interaction, coagential design, retrocomputing, and the cognitive, affective, and behavioral effects of digital breakdowns.
→ jorgen.skageby@ims.su.se

✎ **Lina Rahm** has a Ph.D. in education and is an assistant professor in the Division of History of Science, Technology, and Environment at KTH Royal Institute of Technology. Her research is focused on sociotechnical and educational imaginaries. Specifically, she is interested in the genealogy of the digital citizen, including educational and epistemic imaginaries of AI, anthropotics, big data, and automation.
→ linarahm@kth.se