Philosophy of the City

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Infrastructure, Urban Sprawl, and Naturally-Occurring Asbestos: An Ontological Thought Model for Wicked and Saving Technologies

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Abstract: Recently, geologists in Southern Nevada discovered new deposits of naturally occurring asbestos and microscopic fibers in rocks and soil. The danger is that inhaling them can lead to mesothelioma. One problem is that this rare cancer often takes decades to manifest. This discovery abruptly stalled a highway project near Las Vegas. Due to this condition, management developed numerous protocols to keep workers safe. Using this case as a "thought model," the author challenges an established way of categorizing kinds of technologies as they relate to the concept of being. In turn, this thought model reveals that climate change alters the conditions for being, as recognized in the literature. Advancing this conversation requires that we must reclassify some technologies and develop a categorization for those that reflect a different way of thinking as it concerns being.

Keywords: revealing, enframing, wicked problems, saving power

1 Introduction

Researchers hold that over a million square kilometers of undeveloped land will be appropriated for urban centers by 2030.[1] Numerous infrastructures are required before people can populate these future places. One such challenge that developers, planners, and engineers must address is the possibility of encountering hazards such as naturally occurring asbestos (NOAs) and microscopic fibers present in rocks and soil.[2] When construction-related activities such as rock crushing release these fibers into the air, people are at risk of inhaling them.[3] The danger is that such exposures can make them susceptible to illnesses such as mesothelioma and lung cancer, conditions that can take decades to manifest.[4]

Construction crews recently encountered this situation near Las Vegas while building a highway bypass.[5] The discovery of NOAs brought production to a halt, requiring management to create safety protocols to ensure that workers were not significantly put in harm's way.[6] These measures decreased the overall exposures, supporting efforts to keep the laborers safe.[7] Although this issue raises several ethical worries for workplace safety and future residents, there are also ontological concerns that require attention. In turn, exploring this case – specifically the nexus of infrastructure, urban sprawl, and

1 Seto et al., "Global," 6083.
2 Perkins et al., "Evaluation," 616.
3 Ibid.
4 Manning et al., "Diseases," 193.
5 McCrea, "Asbestos."
6 Ibid.
7 Akers, "As Interstate 11."

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NOAs – serves as a "thought model." It helps us see why technologies that can exacerbate or mitigate environmental and/or social harms require a new classification because of how they affect humankind's existence in ways that earlier conceptions did not.

To situate such a category, we need to recall Martin Heidegger's established taxonomy of technology. This new kind makes sense when we think about it in terms of Heidegger's groupings of technologies as "revealing" or "enframing."[8] The name that I have in mind is "wicked" technologies, which does not mean that they are inherently bad. Instead, they require this title because they are challenging to understand and reveal more significant problems (among other aspects). This notion is consistent with the term "wicked problem," as found in several disciplinary and interdisciplinary works of the literature.[9] Through making a case for this classification, I juxtapose it with "saving" technologies, a concept that we can employ to help create better conditions that will ultimately help shape the conditions of being.[10]

Unpacking the claims above is the purpose of this article. It begins by reviewing Heidegger's thinking in "The Question Concerning Technology," explicitly paying attention to the terms revealing and enframing. With these conceptions in mind, I examine how cases in infrastructure, such as the one mentioned above, reveal the required conditions for wicked technologies. Once I establish their requirements, I contrast them with the kind of thinking that is needed to deliver "saving" technologies. This article ends by examining some of the future research areas that could use this expanded taxonomy.

2 Heidegger's conceptions of technology

In "The Question Concerning Technology," Heidegger examines technology as a way to learn about aspects of humanity that tell us about being, paying careful attention to how we relate to nonhuman nature through it.[11] He argues that such relations say more about us than they do about technology, warning that the kind of thinking that comes along with pursuing technology for its own sake should not be the only way that we think.[12] To elucidate this point, Heidegger puts technology into the categories mentioned during the outset. Revealing technologies are the kind that we associate with ancient societies, in the sense that they "reveal" the power that lies hidden in the Earth.[13] The horse and plow and the windmill serve as examples.[14] The former reveals how agricultural practices can yield food, and the latter can provide the power to pump water from the ground. By categorizing these devices, he shows us the pattern that underlies all technologies that have such abilities that do not go much beyond this degree of sophistication. He exposes something beneficial that, with some ingenuity and elbow grease, provides humankind with a way to work with whatever is available. In a rudimentary sense, the description above is the limit for technologies that fit in this category.

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8 Heidegger, "The Question," 319–25.

9 While there are numerous accounts of what qualifies as a "wicked" problem, the one that lends itself to how I understand it aligns well with Davies' et al. description: "Wicked problems are characterized by complexity, uncertainty, interdependence, and dispute, and tend to be found in highly interconnected social-ecological systems." For more information, see Davies et al., "Improving."

10 Several alternative models are worth exploring that could deliver additional insights into such topics that fall outside of the specific focus of this project. For instance, one could examine the ideas presented in this article through the works of Bruno Latour. Specifically, see Latour, "Where are the missing masses? The sociology of a few mundane artifacts," Latour, *We Have Never Been Modern*, and *Politics of Nature: How to Bring the Sciences into Democracy*. Additionally, Don Ihde's work on technoscience might also be investigated. For more information, see Ihde, "Was Heidegger Prescient Concerning Technoscience?" Lastly, Peter-Paul Verbeek's work on technological mediation might also be useful. See Verbeek, *Moralizing Technology: Understanding and Designing the Morality of Things*.

11 Heidegger, "The Question," 311–41.

12 Ibid., 311–41.

13 Ibid., 319.

14 Ibid., 320.

However, modern people have numerous devices that exceed the depiction above. Through studying them, Heidegger illustrates why humankind requires another category that accounts for the differences. He refers to them as enframing. The central idea behind this concept is that while these technologies reveal the hidden power that ingenuity and the Earth's resources can provide, they do so in a manner that holds natural resources as the "standing reserves." This idea is significant because it is the essential element that separates the enframing technologies from the revealing ones. Consider, for example, how Heidegger compares how a hydroelectric dam has a different impact on the Rhine river than an old, wooden bridge does. For instance, Heidegger holds:

> The hydroelectric plant is not built into the Rhine River as was the old wooden bridge that joined bank with bank for hundreds of years. Rather the river is dammed up into the power plant. What the river is now, namely, a water power supplier, derives from out of the essence of the power station [...]. Whatever is ordered about in this way has its own standing. We call it the standing-reserve [Bestand].[15]

The comparison above illustrates how each technology affects the river. It shows why the dam deserves the classification of "enframing," considering that rivers become a "standing reserve" for us to provide electricity.[16] The river is no longer allowed to only be for its own sake, but it can do so only in the sense that it remains under humankind's control for our purposes.[17]

His primary concern is not to focus on technology to reveal something about it *per se*, or on how it harms nonhuman life, but to study it, so that we may form a free relationship to such technologies.[18] Yet we must keep in mind that the motivation that drives this "free relationship" is due to the way that such relations affect humans. It shows how we relate in general, which implies something about who we are and how we view the world that surrounds us. The idea is that repeating this pattern of behavior across many planes of existence can alter how we think and, in turn, change the conditions for being. For instance, as Hubert Dreyfus reads Heidegger, the bigger picture to see here is not that Heidegger is retreating from technology, but he holds this position to show that there is a danger wherein we could lose the ability to look at being in any other way.[19] If humankind can develop such a relationship that does not view the nonhuman world as the standing reserve, then perhaps a case can be made that we would also not see each other in such a manner.

Yet when we think about these ideas in the present context of wicked problems, such as climate change, we discover that we are facing a new challenge to our being. It is a threat that waits for us in the future most fully, but forces such as hurricanes and extreme weather events already indicate that such concerns are now conditions that impact our being, a point that Ruth Irwin has developed robustly.[20,21] To understand precisely how this process makes sense, turning to Heidegger's thoughts on being and anxiety draws out the connection between them and climate change.

For instance, Heidegger argues that when one experiences anxiety, one cannot deny that one is a being – one that is aware of one's being.[22] The heightened state gained through experiencing sudden

15 Ibid., 321.
16 Ibid., 321.
17 Ibid., 320.
18 Ibid., 311.
19 Dreyfus, "Heidegger," 43.
20 E.g., Irwin, "Climate Change." Irwin, *Heidegger Politics and Climate Change*. Irwin, "Heidegger and Stiegler on Failure and Technology."
21 What also deserves mention is that this project also, very broadly, fits in with the larger body of scholarship that examines the interplay of studies of Heidegger, technology, and climate change. For instance, a few examples of this work, see Irwin, *Heidegger Politics and Climate Change* and also Stefanovic, *Safeguarding our Common Future: Rethinking Sustainable Development*. To take this line of thought in a different, but a related direction, see Brockelman, *Zizek and Heidegger: The Question Concerning Techno-Capitalism*. Although this article topically fits in broadly with the works above, its goal is to expand the taxonomy in a manner that moves toward practical application on a smaller, more manageable scale. For this reason, the municipality makes such endeavors feasible, which counts as a venture into largely unchartered territory in the literature.
22 Heidegger, "What is Metaphysics," 101.

anxiety shows a person that he or she is a being who can experience moods, distinct modes of being.[23] One can argue that anxiety is profound because it is a mood that is nothing like our everyday moods that are so common that we often do not realize being when we are in such states. Anxiety, however, forces us into contact with the notion that we have "Being," which we know through specific modes of being such as anxiety.[24] If we were to be liberal with the term "anxiety," stacking a Heideggerian account of it against anxiety as a psychological term, then we see how climate change is hugely relevant, providing plenty of motivation to revisit Heidegger's conceptions of kinds of technologies.[25]

That is, while Heidegger argues that anxiety makes us aware of our being, psychologists now show that climate change is inducing anxiety in people who must contend with its forces in the future, along with particular groups already feeling such effects. For example, farmers have to deal with the anxiety that climate change brings, which in some cases could increase suicide rates.[26] Viewed in these terms, we can show precisely how climate change has shaped being through the ways that it induces anxiety. This process could easily continue into the foreseeable future. Along with such unfortunate cases, for other people, one can argue that it can create a looming sense of anxiety of not knowing what will happen in the future. They cannot eliminate the conditions that cause anxiety. The reality of climate change's possible harmful effects lacks a direct target, such as an object to fear, but instead it is an abstract uncertainty that they could have to contend with as part of their being. In turn, this scenario promotes a proclivity toward anxiety for some people, which can shape the conditions for being.

Section 3 shows how developing this classification is a necessary move that gives us the means to zero-in on specific technologies that have essential conditions that exceed Heidegger's conceptions. To flesh out this view, I examine the nexus of infrastructure, urban sprawl, and NOAs, a thought model that qualifies infrastructures in such scenarios as wicked technologies. The motivation behind such an activity is that this grouping has unique conditions that are indicative of the (more significant) wicked problem of technology and being in the face of climate change. In turn, we see how this additional category can help us form a relationship to technology while contending with the ill-effects of climate change, one that could benefit humankind.

3 On wicked technologies

Heidegger's approach is arguably sophisticated. He is researching the topic of being, which is abstract, and he is using real-life examples such as named technologies to situate it. This approach requires crisscrossing two different ontological planes, metaphysical and physical. It also requires us to look at the history of technological studies, an inherently interdisciplinary affair. Such an approach leans toward being *integrative*. It brings several kinds of areas together to enhance our understanding of the interplay between these topics. The example below also remains consistent with this approach. It involves mixing being, a highly abstract subject, with the concrete reality of environmental dangers, evident through possible exposures to NOAs. The goal of engaging in this research is to reveal something about the interconnection of how physical realities affect the metaphysical conditions of humanity. It takes the ordinary and problematizes it to the point of becoming extraordinary, an activity that shows a primary benefit of philosophy's utility. In turn, we gain a view of what philosophical examination can provide, which are insights into the urban condition.

23 Ibid.

24 Ibid.

25 For an in-depth examination of Heidegger, anxiety, and climate change that addresses several intersecting and significant philosophical issues, see Myers, "Understanding climate change as an existential threat: confronting climate denial as a challenge to climate ethics."

26 Berry et al., "Climate Change," 123.

While such an undertaking could complicate matters, the thought model of infrastructure, urban sprawl, and NOAs expose the pattern that lies beneath the conditions that pertain to such situations. In turn, the objective is to provide a way to understand the issue by separating the ontological frames. Once the issue is framed in this way, we can use the thought model to extrapolate broader principles that expose details about the underlying pattern that pertains to several other cases that involve technology, being, and climate change. With such specifics in mind, we see how the conversation about revealing and enframing technologies requires an additional classification. It cannot advance our understanding of how such categories are ill-equipped to see how climate change challenges the conditions for being. Due to this situation, we understand why there is a need for the classification of wicked technologies.

For instance, experts previously thought that southern Nevada did not have naturally occurring asbestos.[27] However, local geologists discovered deposits, which alerted managers of an infrastructure project that would meet the transportation demands of travelers and residents, the Boulder City Bypass.[28] This highway extension would allow tourists to reach nearby Las Vegas without having to drive through Boulder City, a situation that had created terrible traffic conditions for residents.[29] The addition of this highway stretch was predicted to lead to developing new neighborhoods and additional businesses.[30]

While initially surveying the issue, it appears benign. However, the danger is that there is no known safe level of exposure to asbestos, and there are not any readily available treatments of cures for deadly diseases such as mesothelioma. From the time of diagnosis, life expectancy is typically one year or less.[31] Along with this illness, other conditions such as asbestosis, lung cancer, and autoimmune issues are possible. When it comes to diagnosing diseases such as mesothelioma, one significant complication is that it has incredibly long latency periods, ranging from ten to seventy years from exposure.[32] This reality means that victims will often not know that they have been harmed until decades later.

When it comes to the professions that have seen the highest number of suffers from asbestos-related illnesses, typically asbestos miners fall victim, along with workers in industries such as shipbuilders and commercial occupations such as insulation installers.[33] While one can argue that NOAs pose less of a threat due to a reduced concentration of asbestos that one finds in rocks compared to refined sources, there is still no known level of exposure that health officials deem safe.[34] This point suggests that *all* exposures are unsafe, even though most victims had lengthy exposures to industrial sources. In turn, engaging in any kind of activities wherein people can inhale asbestos fibers puts them at risk, and the construction project in Boulder City is no exception. Due to the inherent nature that comes with building infrastructure in such conditions, we must consider that they qualify as characteristics that accompany such technologies. These conditions require that we must add to the terminology that Heidegger provides. The goal is to develop a conception that accounts for these conditions. Examining the case above helps us carry out this task.

Consider, for instance, that infrastructures, such as the one in question, expose something about the concept of enframing. That is to say, the delayed danger that accompanies its construction provides a new element that is not significantly present when Heidegger wrote on revealing and enframing technologies. Hans Jonas deals with this point in the context of ethical obligations and the requirements for action, but he did not explicitly address its effects on being. This condition requires us to analyze this situation, showing that there is another dimension to today's enframing technologies. It shows that they qualify as another kind of technology that deserves a place in the taxonomy. This point does not suggest that they are not enframing technologies, but they are a kind of enframing technology that features an additional

27 Sever, "Asbestos."
28 Ibid.
29 Saylor, "Bypass Blends."
30 Schoenmann, "On Verge Of A Boom."
31 Moore et al., "Malignant Mesothelioma," 34.
32 Frost, "The Latency Period," 1965; Lanphear and Buncher, "Latent Period," 719.
33 Moore et al., "Malignant Mesothelioma," 34.
34 American Cancer Society, "Asbestos and Cancer Risk."

characteristic, "wicked conditions." It accompanies enframing in a context that was relatively unknown when Heidegger was writing on the topic. In the same manner that Jonas argues that ethical theory cannot address the implied consideration for time when it comes to modern technology and its accumulating effects, this notion also applies to technology's ontological status. This element is the wicked condition that partly defines wicked technologies.

Due to the nexus of infrastructure, urban sprawl, and NOAs outside Las Vegas, we are presented with the notion that the workers who were building it encountered a situation that could have severely affected their health in due time. The issue is not only that we are dealing with enframing technology *per se*, but we are contending with one that has an extra element, the wicked condition. For the Boulder City bypass, this element was the possible delayed harm that could kill workers several decades after they built the enframing technology (the bypass). Although occupational safety regulations in the US require management to respond to the discovery of NOAs, administration nevertheless took several measures.[35] By implementing precautionary protocols that are believed to have reduced the levels of exposures, hopefully keeping workers safe, management removed or significantly reduced this wicked condition. Reports also indicate that management departed from the view that construction must continue for its own sake, arguably taking steps to care for the well-being of workers.

According to Dreyfus' interpretation of Heidegger, this thinking could suggest that management formed a free relationship with technology. They did not pursue it with uncompromising enthusiasm for its own sake. Such actions exhibit that when dealing with technology while facing harm, there are steps that, if taken, can make the technology less problematic. If we examine the pattern of thinking behind the actions above, then we can apply it to how we think about technology and being in the face of climate change. That is, considering that the accumulating effects of most enframing technologies have helped produce a wicked problem, such technologies should bear this designation.

Consider, for instance, that globally we appropriate seventy-five percent of the world's natural materials to meet the cities' needs.[36] Infrastructures are a primary conduit for their distribution and management. This notion implies that they are now inherently wicked technologies because they presently have the extra element that exacerbates climate change. While at one point in history, infrastructures were only enframing due to holding natural resources in the standing reserve, today they have gone beyond that point, worsening global climate change. In turn, correctly classifying them as wicked technologies is a more accurate description. The point here is not that Heidegger was utterly wrong in identifying modern technologies as enframing. Yet, the notion that humankind must now address the wicked problem of climate change requires us to rethink the enframing technologies in a manner that gives their cumulating effects adequate attention, which in this case is their classification. The goal here – to reclassify them – also signals a shift in what these technologies say about the conditions for being. It is in a condition that, for some people, requires that being must exist in a manner that perceives the world as one that induces anxiety through identifying ways forward that can eliminate such stress.

This point suggests that while wicked technologies can shape the conditions for being, they also present the opportunity to transform such conditions in a hopeful manner, one that can rescue being from such an unfortunate actuality. On this view, being escapes the exclusive conditions for wicked enframing, becoming one of "saving." Along the same lines that technology can be wicked, it can also go against these conditions by saving us from that scenario. This kind of position embodies the power behind the line that Heidegger leaves us with at the end *The Question concerning Technology*: "But where danger is, grows [,] [t]he saving power also."[37] In Section 4, I explore the kinds of technology and the thinking behind them.

35 Akers, "Asbestos."

36 Hodson et al., "Reshaping," 780.

37 Heidegger, "The Question," 333.

4 Saving technologies

Heidegger's approach to classifying kinds of technology through employing lessons from history underscores his points, exhibiting how many of today's devices differ from those of ancient societies. One could argue that the impressive aspect of this strategy is that it takes technologies that we encounter passively, and it positions them so that they give meaning to the conditions for being. He was looking backward, examining technology in retrospect to determine its effect on the present as a way to gain insights into what it says about the conditions for being. While we cannot change technology's past nor shut the door on it, we can comprehend its impact on the conditions for being, no matter how far down the scale we have gone in terms of Heidegger's warning to us as mentioned earlier. Advancing our thinking means that we must also learn to live in a manner that demands rigorous honesty about which technologies challenge or support ways of thinking that reject or embrace the enframing or wicked technologies. We must now develop technologies that can save us (literally), ones that reflect a better way of thinking, which helps define "better" conditions for being. Dealing with saving technologies requires us to change our lens to gain a forward-looking perspective. This orientation does not dismiss the harms that stem from the past, but they do not overly dwell on aspects such as assigning blame. Instead, the primary focus is to identify a way forward – with our thinking, which alters the conditions for being, so that it discontinues the practice of thinking that yields wicked technologies. Such a move would create "better" conditions for being. While this quality and its prioritization are not essentially required for mitigating the harms associated with environmental degradation or social injustice, it is one pathway to changing the conditions for being. It is one that respects Heidegger's warning, creating an alternative to harmful monological thinking. Shifting to such a mindset, however, could help in alleviating the problems above.

The thought model that we can derive from the actions in southern Nevada following the discovery of naturally occurring asbestos does just that. It provides an opportunity to see how we can use lessons from this case to learn about how to apply extrapolated insights to improve the conditions for being, which take Heidegger's warning seriously. The motivation behind employing saving technologies as part of an expanded taxonomy of technologies is that they reveal that being now perceives that world in a way that threatens it. Broadening the ways to categorize technology provides the means for reshaping the conditions for being that remain unrestricted. For instance, Dreyfus holds that, for Heidegger, forming a free relationship with technology requires that we can embrace practices of the past that are not associated with the thinking that governs enframing exclusively:

> Heidegger would say that we should, indeed, try to preserve such practices, but they can save us only if they are radically transformed and integrated into a new understanding of reality. In addition, we must learn to appreciate marginal practices – what Heidegger calls the saving power of insignificant things – practices such as friendship, back-packing into the wilderness, and drinking the local wine with friends. All these practices are marginal precisely because they are not efficient. They can, of course, be engaged in for the sake of health and greater efficiency. This expanding of technological efficiency is the greatest danger. But these saving practices could come together in a new cultural paradigm that held up to us a new way of doing things, thereby focusing a world in which formerly marginal practices were central and efficiency marginal.[38]

This passage holds importance for at least two reasons. First, it shows that in charting a pathway forward that can improve the conditions for being, one that saves us from an ill fate. We can select devices, resources, and procedures that remain premised on the reality of dealing with a wicked and uncompromising problem, climate change. This point does not entail that we can employ the enframing technologies with impunity. However, the notion that deserves underscoring here is that we can choose the option based on its ability to secure saving conditions. Due to this consideration, we must employ a free relationship to develop the practices which will save us from an anthropogenic demise.

38 Dreyfus, "Heidegger," 50–1.

This idea suggests that, for cases that involve NOAs such as in Nevada, we can choose to engage with arrangements of technologies that yield favorable or at least preferable outcomes, given the circumstances. For the case in question, completing the infrastructure project will provide traffic relief to nearby residents, which will modestly decrease emissions from idling vehicles. The discovery of the NOAs happened while the project was well underway. The steps taken suggest that thoughtful deliberation was present, gesturing toward a free relationship, one that favored a highway bypass to mitigate some harm. The takeaway here is that while saving technologies could be optimal, there are instances wherein we should strive for progress despite knowing that we might not achieve perfection. Still, such efforts bolster the global condition of collectively contending with the effects of climate change and perhaps other wicked problems.

Second, while the saving power of insignificant things was applicable before the wicked problem of climate change, the thinking that comes with a mode of being, one that is inextricably bound to saving being, knows that bolder efforts are required. We need the saving power of significant things to reduce the threat to being to give us hope, which, one could argue, serves as the antithesis to climate-change-induced anxiety. Infrastructure can fit in this category due to the monumental impact that it has to transform our lives, which must be built on a way of thinking that can contend with the reality of climate change.

Urban infrastructures include physical technologies such as transport systems, recycling facilities, and sanitation systems. They also include digital components such as information–communication technologies (ICT) that help municipalities monitor and control a city's services. These devices would generally qualify as the enframing technologies. However, if the thinking behind them exhibits concern for reducing the threat to being, one that provides hope, and we can verify positive impacts, then the label is appropriate. Numerous approaches embody the kind of mindset that fulfills this requisite, revealing the kind the necessary attitude. Analyzing such approaches to determine whether they possess this quality makes good use of philosophy. However, scientists, engineers, planners, and other researchers and professionals must evaluate the outcomes, or their likeliness, to ascertain whether a device has the physical properties and the social situatedness that would qualify it as a saving technology or not.

For example, sustainable urbanism, bio-urbanism, cradle-to-cradle design, and urban resiliency have attitudes that reflect a mindset that suggests that the motivation behind their design is not entirely consistent with enframing.[39] Even though they differ when comparing their internal structures, the thinking behind them endeavors to mitigate environmental and social harm. This essential quality goes against the inherent characteristic that we associate with enframing, as Dreyfus points out. When we examine many of the approaches just mentioned above, we find numerous examples of devices that align with the attitude that is required for counting as saving technologies.

For instance, urban infrastructures such as mass transit, safe bicycle lanes, along with technologies such as earth ships and cohousing initiatives, reflect the kind that ecologically hopeful thinking that can mitigate environmental harm. While the thinking behind these saving technologies provides an alternative to the kind of thinking that is associated with enframing, there is more to them than is immediately evident. That is, the saving power in terms of infrastructure rests in imaginative thinking, one that is also behind the enframing technologies. This notion is consistent with Heidegger's poetic ending of *The Question*, as mentioned previously: "But where danger is, grows[,] [t]he saving power also."[40]

The saving power, reimagining the urban condition and transforming it, requires an artistic approach, at least one could argue. Such a measure should signify a new way of thinking that transcends enframing. As indicated above, there are already several approaches for dealing with the design of infrastructure, exhibiting thinking in a manner that is turning away from enframing. The idea that is of paramount

39 For an example of sustainable urbanism, see Farr, *Sustainable Urbanism*. For an example of Bio-urbanism, see Tracada and Caperna, "A New Paradigm," 2. For an explanation of cradle-to- cradle, see McDonough and Braungart, *Cradle to cradle*. For a review of urban resilience, see Meerow et al., "Defining urban resilience."

40 Heidegger, "The Question," 333.

importance for changing our being is to support measures and ideas that can save us from wide-scale ecological destruction and social injustice, which embody a manner of thinking that can change being. Although the claims above sound rather ambitious, they face several challenges, which I explore in Section 5.

5 Challenging wicked and saving technologies

Making a case for wicked technologies suggests that there is a reliable boundary between them and the enframing ones. This notion requires that the enframing technologies were not always wicked, and we only recently became aware of this quality. We were ignorant of this aspect, but our ignorance does not dismiss the reality that the entire time that we were using them, they were playing a role in the impending climate change that we are living with today. In turn, the business of "wicked technologies" is nothing more than new, useless academic jargon that does nothing more to advance our understanding of technology's progression and what it means in turn of our pursuits to understand the conditions for being.

This objection is formidable, and we can resolve it in one of two ways, although there are perhaps more. The first is to claim that Heidegger simply neglected to consider this aspect of the delayed effects of enframing technologies. If this is the case, then it seems as if the claims above that deal with the wicked problems such as climate change are merely the wicked conditions. This point means that the enframing technologies were always wicked. Yet, if this were true, then it would suggest that there is no way to return to a position wherein technologies are no longer a threat to the conditions of being in the sense that being could cease to be – in the worst sense. Such a position would entail that we could never alleviate the conditions that we associate with anthropogenic climate change. However, it seems at least plausible that we could create the conditions, so that we could drastically reduce, slow, impede, or mitigate the effects of climate change – or develop a way to live with them that entirely changes the conversation.

If one of those outcomes occurs, then it seems possible that we could still have the enframing technologies, ones that turn the nonhuman world into the standing reserve. Considering that such an outcome could become a reality, no matter the odds, it nevertheless shows that wicked technologies are not absolute. This point exhibits that wicked conditions are an inherent feature with which we must always contend. Labeling them as such provides the conceptual grounding that could benefit us in terms of creating the conditions that can help shape the conditions for being. Although this concern only applies to the wicked technologies, there are also problems with saving technologies that require attention.

For instance, in the case above that establishes the ontological possibility for saving technologies, there is no mention of standing reserve, which leads to the questions: must saving technologies not hold nonhuman resources in the standing reserve? Must we put distance between the mindset that is necessary to change the conditions for being and the thinking that got us here? The answer to both questions is no. That is, creating a solution to a wicked problem could require us to hold a natural resource in the standing reserve to produce the outcomes that are needed to develop workable solutions. The only caveat is that this kind of standing reserve does not produce significant environmental and social harm (or any injustice).

While this point might appear to be inconsistent with saving power, Dreyfus argues that, for Heidegger, the point is not to romanticize the revealing technology, only to gain command of it, along with the enframing ones.[41] By holding nature in the standing reserve to work toward solutions, such an approach does not reflect the mindset that would yield a narrow way of thinking that would be the only way to see the world, which would depend on how the conditions for being are shaped.

Conversely, thinking about creating a sustainable world, one where people can thrive and flourish, indicates that the primary motivation behind such endeavors is not one that is driven by the desire to

41 Dreyfus, "Heidegger," 41.

disregard nature or people. For instance, harvesting tons of biomass to provide energy might require viewing a species of plant as a standing reserve. Yet, the thinking behind it is to develop solutions for mitigating harm and survival, not inherently producing "more" for its own sake, a point that is consistent with enframing.

In addition to these points, one could also argue that the model of thinking that we would associate with saving technologies should apply to all devices, not merely infrastructure. This point has merit and is insightful. However, considering that the design of infrastructure enormously impacts the nonhuman world, engineers, scientists, planners, researchers, and professionals who have the imaginative power to transform the world would, in turn, transform themselves, exhibiting the reciprocal nature of such an enterprise. Bearing in mind that we are ultimately dealing with a way to improve our thinking, which affects the conditions for being, the above professions will lead by example. They can create the patterns of thought that people need as examples to follow, which could lead to a complete overhauling of how we are thinking about technology and ourselves.

For the case of NOAs in southern Nevada, in terms of how professionals approached the issue, they engaged with a situation that could establish a precedent for similar instances in the future. Despite the reality that the bypass in Nevada facilitates the movement of fossil-fueled vehicles that pollute and that land is held in the standing reserve, wherein in the former could be improved through improved technologies, this condition does not yield any significant harm to people or the biosphere. Yet efforts should continue to improve the overall well-being of both.

6 Conclusion

While exploring these categories has previously helped us examine our technological lives, expanding this taxonomy could help us create a future worth living and the conditions for being that we want. This article identified how the taxonomy of technology that we inherited from Heidegger needs revisiting. After determining the limits of his insights, the nexus of infrastructure, urban sprawl, and NOAs emblematizes how socio-material arrangements hold new dimensions wherein humankind must now consider the delayed harmful impacts that are inevitable in some instances. Yet, with creative thinking, developing "workarounds" can deliver solutions to mitigate harm. In turn, not pursuing technology with an unending enthusiasm for its own sake indicates a way of thinking that can improve the conditions for being, considering that it is moving away from the thinking that is consistently associated with enframing. Being mindful of the reality that wicked problems such as climate change now induce anxiety, which shapes the conditions for being, we understand the motivation to undertake such a task should hold steady.

While this approach has benefits, it also points us in the direction that we can drastically reconceive the foundations of thinking that influence the conditions for being. Saving technologies offer hope in the sense that the future for technology, especially infrastructure, might not entirely resemble its past. If we extend this idea, how we conceptualize being, then there is a good reason to be optimistic about charting a course for its fulfillment. Considering that most of today's technologies play a role in climate change, starting with infrastructure is a promising way to improve the significant sources that have created wicked conditions. If we can reshape the dynamics that hinder our free relationship to technology, then we could rescue the conditions for being.

This move would give us the necessary kind of thinking that can redesign what it means to be a human contending with the urban condition in the face of climate change. The case of infrastructure and NOAs, as examined in the preceding pages, makes this notion apparent. It reveals how reorienting our thinking to favor saving technologies is a way to lead efforts in urban planning that can deliver such outcomes. In turn, this specific issue shows how philosophical analysis could complement the inner workings of city halls.

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