The Hybrid City: How the Blanka tunnel controversy revealed a multiple nature

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Introduction

Prague's Blanka tunnel project has been a site for assembling social relations in the capital city and the Czech Republic for decades. Today it continues to trigger controversies surrounding practices of planning, negotiation, and contestation of this project. This paper focuses on critical moments of breakdown, a series of collapses in a protected park, that provide a particular 'visibility' and a deeper insight into the tunnelling process and question the relationship between the 'natural' and the man-made in city-making. The focus shifts from the tunnel as an object, as a piece of infrastructure, to 'infrastructuring' as a verb, as a process (Merriman, 2016) – as opposed to infrastructure as a stable object – which allows us to open up these problems and reveals actors that have been there all along but were dormant, unseen and unspoken of.

A processual understanding of infrastructure, with a particular focus on the above-mentioned breakdowns, allows for hidden actors, such as soil and water, to re-surface and become more prominent, giving us a glimpse of the natural world embedded in tunnel making. This analysis puts forward issues of translation, ones that question the relationship between the natural and the man-made in infrastructure making. What does the unfolding of these relationships tell us about how we treat the 'natural' world as part of city-making? What does it tell us about the co-existence of the natural and the technical within an urban infrastructure? How do the various actors negotiate this relationship, and how does 'nature' become 'enacted' through the building processes of the engineers as well as the responses from the media and the public?

The collapse of the tunnel becomes a lens into three modes of Prague; or three modes of engagement between nature and technology: the 'green Prague' (nature is out there); the 'safe Prague' (nature is predictable); and 'modern Prague' (nature must be tamed). By following the actors surrounding the collapse of the tunnel: city council members, the mining authority, engineers, citizens' associations representing the public, critical journalists, geologists, and scientists, we see how the natural becomes multiplied. The collapse, as a 'failure of the technical gesture' (Simondon, 2016) separates what is usually blended in the repetitive act of using the park: as long as it works, both nature and infrastructure are invisible.

Following the method of 'mapping controversies' (Yaneva, 2012), the collapses were identified through the keyword mapping process using two types of sources: media articles from three major newspapers featuring the Blanka tunnel between the years 2008-2018 and a collection of articles and documents curated and produced by the non-profit organisation AutoMAT. The identified key concerns become 'moments of infrastructural visibility' (Larkin, 2013; Simondon, 2016; Star, 1999), in which the key issues and the various actors surrounding the tunnel become vocal and visible through the two types of discursive spaces. The key concerns revealed in the mapping are later cross-referenced during interviews with the protagonists of the controversy – engineers, politicians, and activists – and trace their actions in the locales of their practice. Through an ANT methodology, we situate ourselves in the world of the controversy and hear the story through the actors' own words.

A Major Event and the Three Modes of Prague

Figure 1: The crater in Stromovka Park (?TK, 2008)

On the 21st of May 2008, a major Czech newspaper reports the collapse of a tunnel ceiling in Stromovka Park. The title reads: "Stromovka Crater" … "coincidence or conspiracy? On the day that five European

cities signed the memorandum for the protection of parks, the ground collapsed in Prague's most famous one" (Lidovky.cz, 2008). The crater spanned twenty meters across in diameter and the media was concerned about the lack of transparency from the construction company: "Since the engineers knew they were reaching a critical area, why did they not close the entry to the park? It appears as if they were trying to hide the risk from citizens of Prague" (Lidovky.cz, 2008). When the tunnel collapsed for a second time during the the same year, Mayor Bém reported that he would proceed to file a criminal complaint: "I am absolutely furious with the thought that there could have been a child running around here, or a mother with a stroller" (Lidovky.cz, 2008). The collapse took place in the morning, around 10 am, in close proximity to a restaurant and a frequented paved pathway. The engineers maintain a position that the procedures followed were in accordance with the recommendations of the Mining Authority and that the first collapse was primarily caused by rain (Lidovky.cz, 2008). The second collapse was still under investigation at the time that the newspaper article was written, but the construction company justified its position by expressing the technical difficulty imposed by the ground conditions: "The soil in these places is formed by slate, which breaks easily…" and further added that "all available and agreed technical and remediation measures have been applied" (Lidovky.cz, 2008).

The experts' justifications, however, do little to reinstate trust in their expertise, as the two events create a ripple through the media and instil a sense of distrust in the public as well as the City Council.

Figure 2: A keyword mapping from Lidove Noviny newspaper between 2008-2018 reveals the collapses as key events of the Blanka controversy. The cluster on the right-hand side features the phrases "tunnel collapse"; "the police has postponed" and "in Stromovka" (author, 2018).

The actors' reactions reveal three types of concerns that become visible: the protection of the park as an important landmark of green infrastructure in the city of Prague, the completion of the ring road, and the safety of citizens using park premises (the legal aspect). In all three concerns, the responsibility appears to lie with the engineers, while both the public and City Council members are looking for answers and for the persons to be held legally responsible. The park itself however, or more specifically, the elements that make up the park and form a key component of the collapse, are barely mentioned; and if so, only as secondary, or as separate from the tunnelling process itself:

"As if an artillery grenade dropped as if we were seeing the eternally frozen ground in Alaska, where

such holes appear. But in Prague, this is about building a tunnel, it is about how the city tries to save itself from traffic collapse and about how it treats its citizens" (Lidovky.cz, 2008).

In the eyes of the media, the details of the tunnel-building process have no place for contemplation or discussion; it is a "black-boxed" technical procedure, and the grounds on which it takes place should not be reacting this way. The Prague that they know, the busy, traffic-inducing Prague, the cosmopolitan Prague, the Prague that respects its citizens, has no place dealing with things like natural phenomena, as these have been domesticated and adjusted to the city. Their reaction reveals three modes of existence that are normally hidden when the city goes about its daily rhythms. For them, it becomes a question of three distinct and separate issues: the modern Prague with working infrastructure, the green Prague, with elements of designated natural areas, and the safe Prague, the one that respects its inhabitants through adequate laws and procedures.

Three concerns – three modes of engagement

1- The "green Prague" – nature is "out there"

The three concerns put forth by the media exemplify the different ways in which the materiality of the park is being detached by/from the particular understandings of what kind of city Prague is. What these different "modes" of Prague show is a nature/culture divide that becomes visible not only through the actors' discourse but also through a number of their subsequent actions: The first, the protection of the park as a natural resource and as an "untouched" piece of green infrastructure, offers the opportunity to look back and revisit the pre-history of this controversy. Its protection has been a subject of protests since 1988, when the original plans for the Prague ring road were expected to cut through the park, disrupting its natural habitat (Horak, 2007). In the mid-1980s, architects, environmental activists, and transport professionals had expressed concerns over the 2km ring road segment, which was set to cut through the historic park in the form of a covered trench. According to the plans, the tunnel exhaust fumes were to be released directly into the park through its ventilation system (Pavlínek and Pickles, 2000). The plan's critics pointed out both the proximity of the planned freeway to the city's core and dense residential districts, as well as the destruction of parkland (Horak, 2007).

For the citizens of Prague, the park was a place of escape: one of the last spaces of untouched, sacred ground in the city that allowed them a reconnection with "nature" while maintaining a balance between the busy, congested city and their "health" (Horak, 2007). Professional criticism taking place in journals and architectural magazines became accompanied by opposition from grassroots movements, which led to a series of public meetings and citizens' protests in 1989 (Horak, 2007) as a response to transport planners' resistance.

The environmentalists' movements in the 1980s helped place Stromovka Park on the list of protected natural monuments. The re-ignition of the highway plans in the late '90s, however, and the new events surrounding the construction of the Blanka tunnel saw a number of environmentalists' voices reappear in the media and the public scene, as the tunnel generated an entirely new set of environmental conditions and, once again, placed the Stromovka park at risk.

The images of a flood of greenery in a sacred park, as presented by the protestors and the Green Party, give a clear sense of conflict. The calm, peaceful park filled with greenery and happy parkgoers becomes heavily contradicted by the crude, heavy concrete. Here we find ourselves in the presence of a large binary: in this particular event and its associated actors, nature becomes something other; it belongs where technology does not.

The story of the park reminds us of Cronon's paradox: the concept of nature's wilderness reflects a dualism in which "the human is entirely outside the natural" (Cronon, 1996, p. 17). We live in an urban-industrial world while being convinced that nature is our real home, the one we escape to in order to "evade responsibility for the lives we actually lead" (Cronon, 1996, p. 17). The history of the park – it was built and re-built by a number of rulers starting from the 13th century in order to serve as a hunting reserve – shows that there is nothing purely "natural" about the nature of the park, as "there is nothing natural about the concept of wilderness" as it is a "creation of the culture that holds it dear" (Cronon, 1996, p. 16). Law and Lien argue that "nature" is neither simply "given nor made" but instead a "stubborn outcome of myriad practices that together conjure and confirm its existence" (Law and Lien, 2018, p. 132). In the case of the park, "nature" had been defined in the 13th century through a set of building and planting practices, and the physical boundary of its surface had been set. The rearrangement of its elements on that surface gave it a form and gave it a clear set of dimensions. That boundary once again became enacted through the protests of the 1980s and the concerns of the citizens today. Its protection becomes a genealogical persistence of the idealised, romanticised version of the 13th century, giving continuation to how this nature is expressed, contained, and maintained.

Here we see a multiple nature come forward; one version that is constructed by the citizens of Prague as being 'out there', sacred, and untouched, while a different version of it simultaneously exists within a contained, pre-defined and architectured boundary of the park. This multiplicity points to a paradox in city-making. Regardless of the architectured condition of the park in its past, the constructed version of concerned citizens appears stronger as a force that can overturn decision-making mechanisms and can alter the trajectory of a large infrastructure project.

2- The "safe" Prague – nature as predictable/stable

The second concern we come across is for the safety of park users. The "mode" of a "safe Prague" is one where rules and regulations are in place, followed and respected so that no harm can come to its citizens. Following the second collapse in October 2008, we can see the controversy intensify, as the voices of City Council representatives and the citizen's association "Arnika" became present in a number of media sources. The mayor, seemingly angered by the risk posed to park users, announced that the City Council will proceed with an official criminal complaint. The complaint was filed by the director of the City Council, Martin Trnka, against an "unknown perpetrator" for public endangerment and wishes for the incident, in which "no tragedy occurred only by chance", to be resolved by police (idnes.cz, 2008).

Another key actor following the incident was the Czech Mining Authority, whose legal responsibility regarding underground work meant that they had to employ a different, more rigorous approach. After the first accident, the Mining Authority determined that the collapse was caused by complicated geological conditions in Stromovka, while the engineers guaranteed that it would not happen again (Š?ra, 2008). But when Metrostav technicians began digging into a bay inside the tube of the tunnel, meant to serve as a safety bay for traffic, the use of a steel "umbrella structure" was no longer possible. The ceiling above the bay began to crumble, and it soon became clear that a landslide was inevitable. Within an hour, a slurry of clay, water, and slate flooded the underground site, and a twenty-meter crater opened up in the meadow, with a downward narrowing shaft that served as a draining funnel for the wet soil (Š?ra, 2008).

The technical details of the collapse were reiterated in *"Reflex"* magazine by Ji?í Barták from the Department of Geotechnics at the Czech Technical University, who sat on the emergency commission following the last landslide. Professor Barták noted that lives were in fact on the line. According to his statement, both visitors above the ground and workers in the tunnel were at risk. He nevertheless justified the reasons behind the workers' deviation from standard procedure, pointing out that the tunnellers did

not underestimate the situation, since geological surveys cannot reveal all the risks at hand (Š?ra, 2008). The Mining Authority, however, was of a different opinion. Deputy Dušan Havel announced that his office would initiate administrative proceedings against Metrostav since their conditions stipulated that a similar incident would not happen a second time. He argued that the collapse could not be viewed solely from a professional geological point of view but from the fact that civilians were put at risk. Tunnellers held the responsibility of fencing off the surface at the specific point of excavation (Š?ra, 2008).

As responsibility seems to be passed on from one authority to the other, there is one particular actor that is not being considered: the ground, the soil, the very material that needs to be held in place in order for the tunnel to pass under it. But the story of the soil is not recent, as it goes back many thousands of years, when the park was at the bottom of the Vltava River (Engineer 1, 2018). Its former condition gave the soil the properties that forced its collapse on that day. Holding its past through its current properties, the soil reacts to the engineers' efforts to break ground; it resists, and finally, it gives way. The engineers registering its movement characterised it as a 'dramatic geotechnical condition' (Kvaš and Sala?, 2011) in a very complicated urban environment. While these conditions were registered during the investigation, the particular location under Stromovka Park was characterised by 'tectonic degradation' and 'water-bearing and extremely shallow overburden' (Kvaš and Sala?, 2011), which created a very challenging environment for the tunnelling process.

Here, nature appears through the soil and its properties; and it is once again regarded as something that is 'out there', something secondary to the technological procedures taking place underground, by both the mayor and the angered citizens' groups. The soil is only mentioned as an afterthought rather than a key component of the breakdown.

What the reaction of the soil alludes to is a different type of infrastructural relation which has only recently been explored as part of infrastructure studies (Blok et al., 2016). As infrastructures have been primarily analysed as technical and sociotechnical systems, a more-than-human relation to the soil requires a different translation, one that takes into account a reciprocal relationship between the technical/material and the natural/material as they become negotiated. What was understood as stable and predictable (and at first invisible) was, in fact, the subject of numerous geotechnical calculations and adjustments that needed to be maintained by the engineers in order for the soil to remain stable and silent. As we follow the controversy and trace the actors involved, we find that it has to be renegotiated and reconfigured as its boundary is disrupted. It becomes clear that the ground the park was built upon can no longer be taken for granted. What we witness is a renegotiation between the natural and socio-technical that reshuffles what are traditionally thought of as infrastructures towards new ways of understanding their relationships with the natural world.

3 -The "modern" Prague – nature must be tamed

The key concerns of the collapse were discussed with two leading engineers of the project through interviews: one from Metrostav, the company responsible for the excavation work, and one from SATRA, the project manager. During the discussion, the engineers recall the details of the events and what followed, allowing us to trace their actions in locales of their practice and to situate ourselves in the world of the controversy.

The engineer from Metrostav acknowledges the collapse as a critical point of construction and explains how the requirements of the tunnel were met with the structural challenges of the particular location under park grounds:

“We had two constraints that proved very difficult to tackle during this critical moment. One, was the no entry condition into the park. Whatever we did, we had to do from underground. There was no way we could have controlled the soil from down there. The second, was the traffic junction we had to reach in a few hundred meters of distance. We had to maximize the possible incline of the tunnel as much as regulations allowed, in order to reach ground level at that particular junction. You can imagine, when you have an 11-meter hole in diameter, above your head you have 1,5 meters of rock and above those 15 meters of watery gravel, then we are reaching the limit of the technology which we are capable of using” (Engineer 1, 2018).

Due to these conditions, there was a safety distance the engineers had to follow, but it only took a small deviation from the contractors for disaster to strike. The engineer compares it to a stone arch, where if you take out one of the stones, the entire structure collapses. This could have been one of the reasons, or the key moment, why a particular stone that was holding everything together gave way, allowing the slurry of gravel and mud to flood the tunnel (Engineer 2, 2019).

The engineer drew a quick sketch to illustrate (Figure 3). The left-hand sketch in Figure 3 shows how the alcove of the safety bay created a larger footprint in the tunnel diameter, which became the critical point of collapse in October 2008. He argues that, theoretically, the bay should not be there. The traffic regulations, however, require that vehicles have a safety bay area to pull into in cases of emergency. “So, there is a risk involved in both situations, whether you incorporate the bay or not” (Engineer 2, 2019). On the right-hand side (Figure 3), a smaller section (the exploration gallery) and a larger section (the tunnel tube) can be seen intersecting with the different layers of the soil, while the vertical lines indicate the concrete being injected into the gallery as a stabilisation method. This essentially creates a “pseudo-concrete slab”, as the engineer describes it, reinforcing the setting. The fact is that no one really “sees” into the ground, and it is therefore impossible to know where exactly the injected concrete becomes deposited (Engineer 2, 2019).

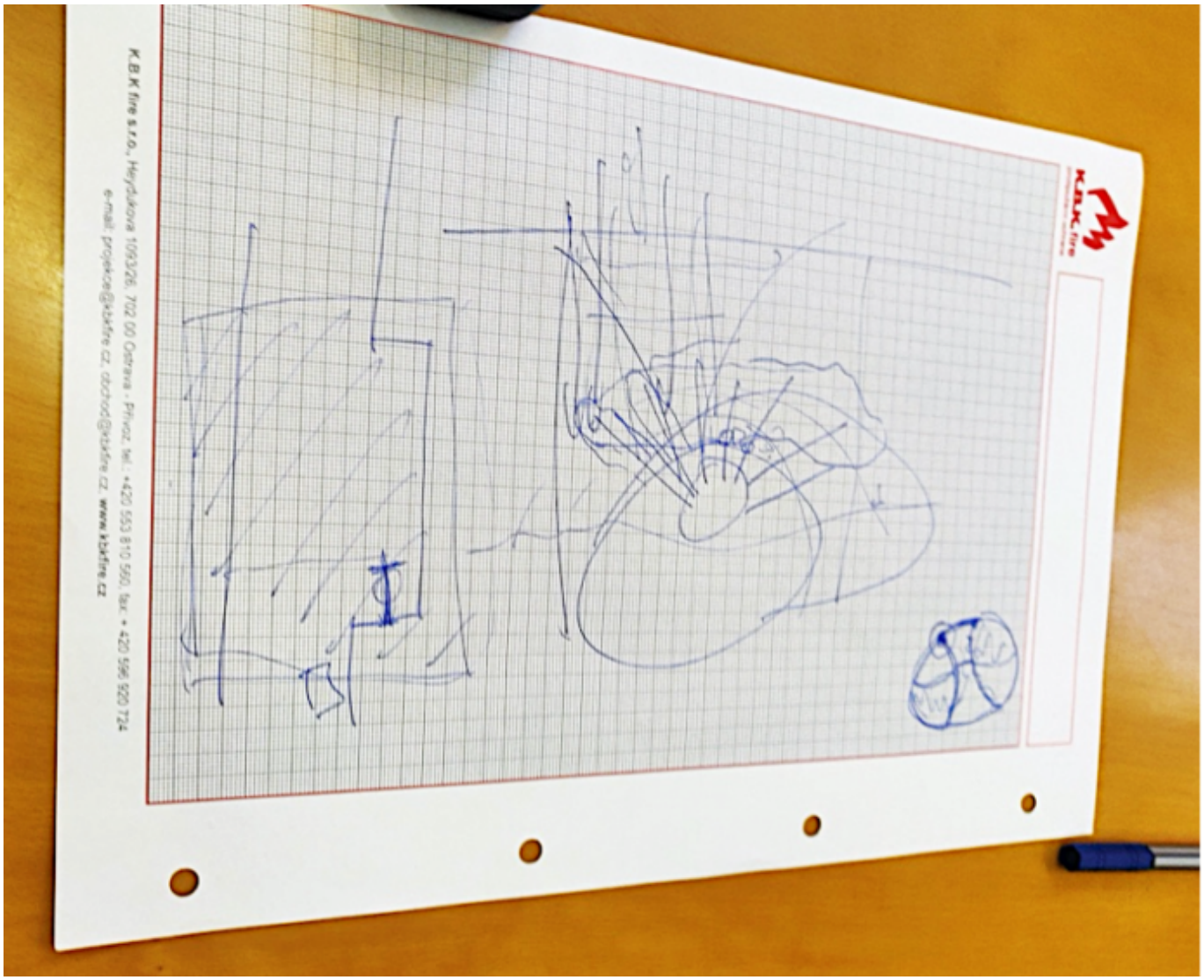

Figure 3: The engineer from SATRA drafts a quick sketch to illustrate the tunnel section in the context of the park, in relation to the ground surface (author, 2019).

For the process to continue, the technicalities of tunnelling must be adjusted, even if that causes the disapproval of environmental groups and activists alike. The nature that was once contained within a horizontal plane now becomes subject to another form of containment, this time a molecular one, as the soil needs to be stabilised through a man-made material that is concrete and a series of practices that ensure its safe stabilisation. The control over the “natural” aspects of the ground needs to be regained in order for the engineers to fulfil the promise of the “modern” Prague that provides mobility for its citizens. But the Prague that is becoming composed here is not just contained within the park; it is much more than that. For the engineers, the containment is also about something bigger: the infrastructure, its connections and the urban mobility it provides, and therefore, the completion of the ring road. The localized method extends to their ability to re-infrastructure Prague successfully, in the way that was promised to its citizens. In a way, the engineers become the mediators between the soil and the concerned citizens; between the molecular nature and the romanticised concept of nature that is ‘out there’.

Conclusions

In this article, we followed moments of technical failure that provided a particular ‘infrastructural visibility’ and a deeper insight into the technical process of tunnelling. As the soil’s movements are registered by the engineers, they have to renegotiate their technical procedures, and the previous

relationship between the soil and the technical elements needs to be reshuffled. The variability of the soil needs to be incorporated into the technical procedures going forward for the tunnelling process to continue and for the project to be completed. It is no longer passive but an active participant in the tunnelling process of Blanka and of Prague, a part of the socio-material composition of the tunnel as much as concrete, steel, and gravel. The soil becomes the connector of the multiple modes of Prague we have seen unfold, showing that the three modes of Prague presented here cannot be untangled and remain invisible in the functioning city. Although we have seen the multiple versions of Prague being distinguished by the actors, the elements of each overflow into one another to make the hybrid city that is Prague, with its non-human entities appearing and reappearing at every challenge that needs to be dealt with by the actors. How do they become entangled? The need to integrate the soil's variability into the tunnel-making process that connects them together. Through its collapse, the soil becomes the element that forces a renegotiation of the natural and the socio-technical at the same time, and now the process of tunnelling needs to be reassembled for Blanka to be held together.

Exploring the relationship between nature and infrastructure, this chapter contributes to the conversation of 'infrastructuring environments' (Blok et al., 2016). It recognises infrastructures as being in constant dialogue and/or contestation with the natural world that technological procedures have aimed at taming. The collapse of the park illustrates that the park is not passive in nature, "but rather an assembly" (Yaneva and Zaera, 2015, p. 3) to be discovered. It urges us to re-think the ways in which we interact with nature, acknowledging the capacity of all natural entities to affect and also to be affected, therefore responding to human agency (DeLanda, 2015). Gaining access to this assembly means accepting that there is not one objective definition of the park that everyone will agree on. But accounting for the participation of all of the human and non-human actors is what will give us access to the cosmos of the park. We could, therefore, argue that new forms of engagement are a necessary step towards uncovering the hybrid connections in infrastructuring practices and forcing a rethinking of the natural/technical relations in city-making and the cosmopolitical negotiations that need to take place.

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