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Re-Imagining River Restoration. Temporalities, Landscapes and Values of the Emscher Set in a Post-Mining Environment

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ABSTRACT: *The restoration of the Emscher began in the 1990s. It brings us to a former centre of industrialization—the Ruhr Valley in North Rhine Westphalia, Germany—and reveals challenges of post-mining, such as pollution and subsidence. Three concepts are central to understanding the restoration of the river: landscape, temporality and value. Through three stories we investigate these notions in different constellations and ask how they can help to reimagine the river: through (1) a proud, modern, reassuring story of liberation from a dirty past into a clean and flourishing present; (2) a story celebrating maintenance, and the efforts, work and resources of the enormous underground water infrastructure that supports the health and well-being at the surface; and (3) a ruin story reimagining the eternity burden imposed by the legacy of mining, and appreciating the arts of noticing how to live carefully in this area with this history. Thinking through the three stories helps appreciate different kinds of actors, knowledges and realities attached to the Emscher's restoration. By developing the notions of landscape, temporality and value, we propose a multi-faceted approach to distinguish between ways of enacting a post-mining's site ontology.*

KEYWORDS: *Ontologies, Underground, Valuation, Ruhr District, Ruins*

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Introduction

The river Emscher flows through the Ruhr district in North Rhine-Westphalia, Western Germany, which used to be a coal mining hub of industrialisation. Today it faces key challenges of the post-mining era. Just like the area, the Emscher river has an eventful history: it lived through phases of transformations, it contributed to the shaping of coal mining while also being shaped by it, and its toxicity is a matter of concern to this very day. The Emscher has been rebuilt several times and bears traces of the different phases of reconstruction. Our discussion takes its point of departure in the most recent construction phase, which started in the 1990s when it was decided that the riverbed was to be *renaturated*, as it is framed in the region (e.g., Scheck et al. 2013). Renaturation is a practice to restore rivers, where the emphasis is laid on bringing into existence particular contemporary nature-culture relations: quality of life will be improved by returning to what is considered a cleaner

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and more harmonic pre-mining past untouched by humans, yet situated in an environment where planners, politicians, scientists, engineers and citizens place special demands on their immediate surroundings. In this paper we discuss temporalities, landscapes and values that are enacted together with the Emscher restoration.

The literature on post-mining areas, such as the Emscher Valley, point to the unruly character of such regions and their openness to interpretation (e.g., Beckett/Keeling 2019). In post-mining areas, the interconnection between ontology and narrative becomes particularly challenging. Abby Kinchy et al. (2018) specify that dirty objects and objects in transformation tend to slip mono-vocality. This is also the case with the Emscher; there always seems to be yet another story to tell. In Science and Technology Studies (STS) it has become a common strategy to tell stories that stay true (Verran 1999) to the multiple enactments of an object (Mol 2003), their mutual tensions and frictions (Tsing 2004; 2015), internal differences (de la Cadena 2015) and partial connections (Strathern 1991). Bringing post-mining literature together with STS scholarship provides an opportunity to tell stories about the diverse ontology of the river and the river's restoration. Ontology is here understood as the river's situated socio-material enactment. In contrast to inquiring different perspectives on the river and its restorations, different interests or other human-centred engagements with the river, the concept of ontology draws our attention to the river itself. The »river itself«, i.e. its ontology, emerges in different ways contingent upon how social and material actors assemble to shape it. Consequently, as a matter of course, the river is diverse, and thus multiple (e.g., Mol 2003). Following this understanding, the river in any situated socio-material practice has one specific ontology, while at the same time having more than one. Different practices co-exist, each making different yet entangled ontologies co-emerge. The stories of this article point to such different ontologies. More than one, yet less than many, is the definition of the multiplicity of ontology. Stories work as a device for navigating the ontologies, reimagining life in post-mining ruins, and for discussing how to live with the challenges offered by the Anthropocene.

In what follows, we tell three stories about the Emscher. Thinking in terms of stories and their ontologies is an alternative to talking about facts about the world. The notion of fact suggests a gap between the knowledge transported and the object the knowledge is about. Stories, on the other hand, draw on Law's (2002, 63) emphasis that »knowing is as much about making, about ontology, about what there is, as it was ever about epistemology« (cf. Eitel/Meurer this issue). Professionals' knowledge involved in the Emscher restoration is a necessary and active component in realising the restoration—that means for reshaping the ontology of the river—just as machines, pumps and concrete are. Using the term stories rather than facts or knowledge helps draw attention to their situated nature and their ontological interrelations with the narrated objects. Law (2002, 64) emphasises the importance of attending to the »stories that run through us«. Stories run. They are situated and experienced. This paper tells the story of how we came to know the restoration of the river Emscher. We use the device of telling stories of the Emscher to clarify how and where they came to us and how they—in the encounter with our reading of current STS and post-mining literature on the Anthropocene—also moved us to tell a different story (cf. Pandian 2019). The stories run through us and are therefore personal. But we are not just persons, we are scholars, and our stories come to be ontological versions of our trans-disciplines of STS and post-mining studies. We tell three different stories, since it is not only the stories that are important, but also their interrelations.

Even though storytelling is core to our understanding of the Emscher, this paper is not principally about storytelling. It is about the Emscher and its renaturation. We encountered

the river in three different versions, which we describe in this paper: While the river Ruhr delivered drinking water to the quickly increasing population of the Ruhr Valley in the 19th and early 20th centuries, the Emscher was turned into a wastewater canal. In 1992, the area's non-profit water management cooperative *Emschergenossenschaft* initiated a 30-year project to renaturate the Emscher. The involved actors wanted to regain a vital network of water, fish and plants, living in harmony with humans. This, then, is the first story: with the label of Emscher 3.0 (Scheck et al. 2013) a new and healthy river is narrated in modernist and hopeful progress-oriented terms. A second story goes beyond the visible renaturated stream and centres on subterranean waste-water canals taking care of the filth, and on water pumps, dykes and other parts of the engineering infrastructure of the river. The third and final story is a story of ruins. Without the extensive and continuous energetic efforts to drain the area, the Ruhr and Emscher Valleys would be transformed into a lake district of toxic water. Approaching the Emscher renaturation through ruination literature provoked us to ask very different questions about the liveability of this post-mining area.

Two interlinked questions guide this article: What constitutes the ontology of the Emscher river and its restoration? How do we (re-)imagine the river and its restoration in ways that are relevant? Before focusing specifically on the Emscher, the following section introduces the aspects of post-mining literature that are relevant for our discussion: that means with a particular focus on temporality, landscape and values. Following this, we present the study's empirical material, informants and methodology. The discussion of methodology also touches on the STS conceptualisation of ontology and storytelling (cf. Jensen this issue). The analytical section presents three stories of the Emscher renaturation, and in our final discussion and conclusion, we summarise the findings and lay out the argument implicit in telling the three stories as we do: suggesting these as a device for reimagining the Emscher renaturation without losing sight of existing and dominating imaginaries.

Temporalities, Landscapes and Values

During recent years, various new contributions have been made in the area of social studies of post-mining, from a multitude of perspectives and by digging at different empirical sites. The term post-mining refers to sites where material resources used to be extracted, whether by open-pit or underground procedures and where attention is given to the maintenance and care of these sites and their surroundings after the primary mining operations have ceased. This is also the case for the Ruhr area, where the last hard-coal mine was closed in 2018. The following brief introduction to the field helps situate our approach to the Emscher in the theoretical and methodological landscape of the social sciences.

Anthropological studies of mining provide an important backdrop for post-mining studies (e.g., Godoy 1985; Ballard/Banks 2003), which highlights the outstanding position that ethnographic perspectives occupy in the field. Scholars with an STS-sensitivity have recently founded *underground studies* to emphasise the importance for social science to attend to not only what takes place in the human habitat above ground but also to the unruly landscapes unfolding under the planetary surface, that are mostly invisible to humans (Kinchy et al. 2018). This understanding provides leverage to study mining and post-mining practices as part of wider relations and calls for creative investigations to engage in infrastructural inversion (cf. Bowker/Star 2000). Kinchy et al. (2018, 30) condense underground research into two core questions, which towards the end of our analysis help address the normative

aspects of restoration and our engagement with the Emscher: »Should we dig here«? and »How should we reclaim this surface«?

In our analysis of the Emscher, three concepts of the post-mining literature turned out to be central: temporality, landscape and value.

That temporality is a central term for engaging with post-mining sites and practices is indicated by the prefix post. Caitlynn Beckett and Arn Kealing (2019) note that post-mining implies an after without an ending. Furthermore, post-mining sites extend the life of what has passed, what is otherwise considered dead or extinct (Gan et al. 2017): waste endures after mines have been closed (Lepawsky 2018). Referring to the temporality of post-mining sites, Rob Nixon (2011) and Max Liboiron et al. (2018) draw attention to the »slow violence« of toxicity that endures in these sites; violence executed over extended periods of time. In this line of thought, *post* designates an *after* with unique and site-specific consequences that require persistent engagements and critical attention. When studying post-mining sites it is important to emphasise the continuity between what we may call *durante* and *post,* as it is neglected by dominating discourses that tend to define the temporality of post-mining by pointing to a break between mining periods and the phase following (e.g., Bainton/Holcombe 2018). In our empirical stories about the Emscher we trace how temporalities are done together with the multiple ontology of the river restoration, and we approach this in terms of how *before, now*, and *after* are constituted as continuities, are separated by breaks, and are non-simultaneous, co-existing or otherwise.

The emphasis on temporality in post-mining also reveals how landscapes are far from stable. Beckett and Keeling (2019, 220) note that »[o]ver time, mining landscapes may shift from landscapes of ruination to landscapes of regeneration and reuse, to demolition and ruination once again.« What a landscape is, that means the ontology of a landscape, is a multiple effect of, among others, stones, minerals and water flows, vegetation and fauna, and of human interventions such as through mining and of variations of experience. Ellen Zegura et al. (2018) explain how a research participant in an urban housing project was particularly helpful in understanding the neighbourhood's landscape because she was a former drug dealer and thus extraordinarily knowledgeable about the history of the area's buildings, including which houses were occupied, abandoned or occupied by homeless people. The researchers' way of knowing and thus their experience and sense of the landscape were substantially different. Beckett and Keeling (2019, 220) underline that a post-mining landscape may be »considered a toxic wasteland, an unused barren landscape, a historically treasured site, a home for survival and (re)production, or a degraded sacred space.« What landscapes are must accordingly be considered an empirical question; a question we attend to in this article for the Emscher landscape. We are interested in how the Emscher landscape is enacted in different ways: and we approach this as a matter of which, and how, environments are experienced; how and what attention is thus given to the environments; and how these are accounted for.

A last, crucial aspect from post-mining studies that is worth highlighting for our analysis is the field's engagement with values, which are inevitably folded into both temporality and landscapes. Of interest here is not primarily economic value as a driving force of mining companies and their shareholders, and of nation-states in search for competitive advantages or developmental projects (Mitchell 2009; Burchardt/Dietz 2014). Rather, the notion of values serves as a device to discuss priorities, desires and recognition invested into reconstruction processes or resulting from them. Having our field site of renaturation in mind, we can draw on a particular conceptual distinction of post-mining studies that helps emphasise the essence of studying values. In their review article, Beckett and Keeling (2019, 218) dif-

ferentiate between *remediation* (»removing contaminants or stabilising them on-site, and reclaiming [...] some elements of pre-mining ecologies«) and *restoring* (»bring[ing] about a former state or to return to health«). On a more general note, their discussion indicates that renaturation efforts are often found to be idealised efforts, hardly achieving what they claim to achieve in either remediating or restoring a site. However, we do not focus on such a unidirectional, critical diagnosis, and this is also not what post-mining studies usually put at the centre of their discussion. Values are no fixed units, which can be invoked as stable entities in the form of ideal(ised) stages. They are formative social forces, which can be traced back to heterogeneous and locally situated practices. Studying *valuation practices* is the way forward in unpacking the Emscher renaturation (Lamont 2012; Kjellberg/Mallard 2013), thus analysing the intricacies of how orders of worth, preferences, and affects are inscribed into the rebuilding of efforts. The field of post-mining urges us to use the term of values to look out for surprising and emerging relations. Through the engagement of different restoration efforts, Marion Hourdequin and David G. Havlick (2015, 3) emphasise that the justification driving a restoration effort may shift—engaging with a ruined local area, thinking and doing it differently, may help a community to come together in a new way, »restoring« its bond, as it were.

With our analysis, we aim to unfold how different accounts of the river Emscher enact different landscapes, temporalities and values. Before doing so, we clarify our methodological approach in the next section.

Stories and their Ontologies

The paper follows the process of learning about the Emscher restoration, starting with the evening one of the authors first heard about the river at a lecture. The other author grew up in the region and was familiar with the peculiar stories surrounding the wastewater canal, as most local people are. His uncle allegedly slipped into the canal as a child, which from then on served as an amusing family anecdote: despite several hot showers, the faecal smell would not disappear. This seems to be quite a familiar story. The nickname of the Emscher wastewater canal is *Köttelbecke*, or *Poopstream.* We were told several stories about the Emscher when talking to locals. Older people remembered the thrill of jumping across the *Köttelbecke* as children, preferably when human faeces were visibly floating down the stream. Stories also tell that dogs and perhaps even humans have died after slipping into the canal.

While we won't discuss these intimate stories further, we mention them here to point to the cultural significance granted to the Emscher (cf. Berger et al. 2017). Apart from the personal memories that locals have generously told us, from bus drivers to colleagues, family members and students, we also draw on interviews and conversations with members of staff of the water management cooperative *Emschergenossenschaft* as well as on lectures by some of them: the CEO, the head of Technical Services, the head of River Basin Management, and a landscape ecologist from the same department. The sampling procedure was a mixture of snowballing and direct contacts with experts and has been used complementarily to our literature and internet research. In addition, one of the authors conducted a student project on the Emscher that included expert lectures and an excursion to the river. Her students' engaged comments and questions have been helpful for our reflections. Our empirical engagement with the Emscher and its restoration unfolded between 2017 and 2020.

Our research interest is to learn how the restoration of the river Emscher is enacted and how that shapes the ontologies of the river. Our engagements with the actors and material

around the river restoration and our simultaneous reading of the post-mining literature led us to focus on how temporality, landscape and values are enacted together with the Emscher. It soon became apparent that there was more than one temporality, more than one landscape and more than one value realised with the river restoration. Or put differently: there was more than one ontology of the river, while obviously also less than many (cf. Mol 2003). Therefore, this analytical attention resulted in the three accounts below, narrating different temporalities, landscapes and values of the Emscher restoration.

Our engagement with the river restoration became more than analytical: we became excited about the restoration, impressed with what the project had achieved, extremely curious about how history and future were reconfigured through the engagements with the Emscher, and horrified by the toxic reality, which raised both social and ethical questions. The tensions between being impressed by the restoration and being unsettled by the hazards inscribed into the endeavour made us listen more carefully to the stories we were told, and those we came to tell. The methodological question of how to engage with stories and their ontologies became an accompanying inquiry of this paper.

When we use the phrase »stories and their ontologies«, the meaning of »their ontologies« is ambiguous. It may, on the one hand, refer to the stories themselves and their ontologies in terms of their situated socio-materially enacted being. On the other hand, »their ontologies« may refer to phenomena that are apart from, but belong to, the stories, which gave rise to them and may be affected by them and following from them. We use the phrase »stories and their ontologies« to refer to both and we thus point to the inseparable ontological interlinkages between stories and the phenomena that the stories in more plain terms are ›about‹. As we emphasised, stories run through bodies and materialities and evidence the continuation between the Emscher restoration and the stories we tell. Rather than envisioning a spatial relation of ›the Emscher there and stories here‹, we imagine a processual continuation of Emscher restoration and its stories; a temporal material-semiotic interlinkage. In her »reader's guide to the ›ontological turn‹«, Mol (2014, 1) proposes three key questions when studying ontology, which articulate the entanglement of ontology and knowledge: »What are the topics, the concerns and the questions that knowledge practices insist on; how do they interfere in practices; what do they do to/with« the actors involved? We use the term story instead of knowledge to emphasise their active and situated character. Just as much as knowledge stories are entangled with ontology. It became undeniable that this is more than a theoretical point when experiencing the need to tell our own story; the last of the three stories below. The existence, and the creation of, alternative stories are necessary for the creation of alternative ontologies.

In the next section, we tell three stories to unfold the ontologies attached to the Emscher. There are certainly more stories and the three are far from the complete list. Yet, the first two were prominent narrations in the field and among those that most strongly provoked us to complement the discussion with an intervention from current STS literature on the Anthropocene, which story number three aims to bring forward.

Three Stories

First Story: a Modern River

We first learnt about the Emscher renaturation when one of the authors attended a colloquium at the social science department of our university. An alumnus of the department

and now head of the Ruhr district's water management cooperative *Emschergenossenschaft* was invited to give a talk about what the cooperative calls the Emscher renaturation. He introduced the river's wellspring 144 metres above sea level (m.a.s.l.), in the wooded Ardey Hills (*Ardeygebirge*) just to the East of of Dortmund, and explained how the originally meandering stream flowed into the Rhine after 109 kilometres, at the level of 21 m.a.s.l. These numbers matter for planners interested in assessing the river's force. From the gentle Ardey Hills downwards, the average gradient of the stream was only 1.5 per mille, resulting in a decline of just about one metre per kilometre (Bezirksregierung Münster 2015). This is what created the landscape of a meandering stream rather than one rushing to its mouth in the Rhine. Since then, the mouth of the river has been twice relocated towards the North in order to improve—or even create—the water flow. Today the length of the river has been reduced to 83 kilometres and its mouth is in Dinslaken.

In 1758 bog iron ore was found in the Emscher Valley and the St. Anthony steel mill was founded on the bank of the river. Industrial mining followed half a century later with excavations up to 1600 m underground in a mine north of the source of the Emscher, in a pit in Bergkamen (Henkel/Melchers 2017). The transformation of the underground landscape was paralleled with a transformation on the surface. The underground excavation was labour intensive and the Emscher Valley's population increased over a century and exploded from 700,000 in 1895 to more than two million in 1905. In addition to the parallel developments on the surface and the underground, the transformations of the underground literally undermined the surface landscape. Up to 20 metres subsidence was caused by mining (Meyer 2002; Grün 2011). Contrary to other cities with intense urbanisation in the same period, the building of a sewer system was not an option in the Emscher Valley, as the subsidence was likely to make it collapse (Wittkampf 2012).

The large volume of wastewater became a problem, both from the massively increasing number of households and from the mines. The invention of the steam-engine enabled continuous draining of toxic pit water from the mines. The water was fed into the Emscher, which, due to its slight gradient was not able to transport the effluent: the water remained in the valley. Black and white photos of barefoot children wading through the toxic flooded Emscher are among the traces left for us to understand one of the reasons why plagues spread, weakened the population's health and led to the deaths of 350 people in the 1901 typhus epidemic (ibid.). The *Emschergenossenschaft* was founded in 1899 to put an end to the unhealthy situation, and in 1910 it started building what came to be known as a corset for the Emscher: a narrow concrete bed with steep banks to improve the flow of water and restrict its flooding of the area. Surrounded by dramatic warning signs of the risk of death if one slipped into the water, the Emscher was turned into an open wastewater canal. What used to be an environment rich in biodiversity was now biologically dead and sometimes referred to as »the river of hell« (Cioc 2009, 91). The construction of the wastewater canal took several decades and was finally completed in the 1970s.

With the decrease of mining in the second half of the 20th century, ideas emerged to terminate the ugly, stinking and life-threatening wastewater canal, and to renaturate the Emscher river. The water management cooperative *Emschergenossenschaft* initiated this 30-year project in 1992. And, almost 30 years later, large parts of the Emscher have been restored. While not meandering as it did in the pre-mining times, it does curve softly through the landscape, warning signs replaced by green reeds, soft sounds of the gently eddying water and well-planned paths for Sunday strolls and bike-rides. In the department's lecture hall, the head of the *Emschergenossenschaft* proudly let one slide after the other show photo evidence of this impressive transformation. Pike and catfish have returned to the riv-

er; nature classrooms have been established for school children; biodiversity has radically increased; and even a small wine production has been realised based on grapes from the renaturated Emscher shores. Economic and living conditions, the presenter emphasised, are likely to improve as well (cf. Rheinisch-Westfälisches Institut für Wirtschaftsforschung 2013), partly due to the opening of expansive new leisure areas (cf. Sato 2016).

In the Ruhr district, a leading approach of public officials is to re-evaluate the local area through the imagination of a new city-scape. Former industrial ruins are used to showcase creativity, to convert a once heavily industrialised area into a paradise for the service industries. Contributions from the field of the sociology of work challenge this focus, and the plausibility of the accompanying *transformation hypothesis* more generally (Heinze/Hoose 2013). However, the image of a mine-become-exhibition place is a well-known trope in the area that cannot easily be deconstructed. An example of this was the 2010 *European Capital of Culture* that allowed the Ruhr Valley's 53 municipalities to present themselves as thriving urban areas on the move. It might not come as a surprise then that, as part of this *Ruhr.2010* event, the renaturation of the Emscher was on display as »one decisive factor« in moving »from industry to art and culture« (Regionalverband Ruhr 2010).

The narrative that the head of the *Emschergenossenschaft* presented in the social science lecture hall—which we re-encountered in the cooperative's publications and in popular accounts—was a proud, reassuring story of liberation from a dirty past into a clean and prospering present. The temporality enacted follows a progressive imagination: the renaturation confidently rendering the mining past left behind for good. With the help of engineers, linear progress is conceptualised along with a discontinuity between the mining past and the Emscher's post-mining present. The landscape is configured from the perspective of the well-being of the people living in the area and their opportunity to flexibly and freely unfold their individual life perspectives. Resonating with the post-mining literature, and discussions on remediation practices in particular (Beckett/Keeling 2019, 219), we can see how the Emscher landscape of waste and toxicity has been rebuilt while the rebuilding is shaped by, and has come to enact, particular values. The actors involved emphasise the emancipation from mining industries, dangerous contamination and disease. The story mobilises a desire for the Ruhr Valley to be an attractive urban area that enables individuals to work and live in comfortable and safe surroundings. The new restored Emscher river adds to this image of a habitat worth living in. We refer to this story as a modern story due to how it draws on modern ideas of progress and belief in the future, on land as a resource for human well-being, and on emancipation as a core value.

Second Story: Emscher Infrastructure

The modern story of progress and emancipation was told in a university lecture hall. It fit perfectly in this context, and the audience was entirely pleased with the narrative of their former student. Yet, our attention was drawn to a different story when one of the authors made an excursion to the Emscher River with a group of students a few months later. She wrote in her field notes from the trip:

> »A biologist from the *Emschergenossenschaft* wearing rubber boots welcomed us to the Emscher. She equipped us with small nets and invited us to step into the small stream, no broader than we could jump across, and with clear, cool water so shallow that no-one would ever risk getting water into their boots. We were now able to catch and observe the living evidence of increased biodiversity. While absorbed by

> this gratifying experience of immersion in this new nature, I looked up and glanced around at the surroundings. I noted a maintenance hole just next to the river, and allowing my attention to leave the stream, I heard the roaring sound of rushing water surfacing via the maintenance hole from underground; a sound of much more water than in the stream surrounding my boots.« (Fieldnotes ES 23.02.2018)

Standing in the river and with the modern, revitalising story still in mind, wastewater had come to seem a phenomenon of the past. Yet, as waste studies repeatedly remind us, the absence of waste at one locality only indicates its presence elsewhere (e.g., Hetherington 2004; Gabrys 2009). In order to free the Emscher from wastewater, the effluent had to go elsewhere. The sounds from the maintenance hole hinted at the ›elsewhere‹: the underground. Now, with the attention drawn to the underground, the modern story of urban living conditions and social well-being came to read like a surface story. In economic and material terms, the restoration of the Emscher is more than anything a wastewater project. Five billion Euros is the cost of the 35,000 sewer pipes with an inner diameter of up to 2.8 metres. The core artery is the 51 kilometre-long Emscher sewer tunnel, which conveys wastewater up to 40 metres underground. The *Emschergenossenschaft* describes this as the largest sewer system in Europe and one of the most advanced worldwide (Fröhlich/Wilts 2015).

The clean water of the new Emscher does not only depend on sewers and the drainage of household and industrial wastewater. In order to avoid polluted water from streets and agriculture to flow into the Emscher, the river has been elevated. This and the extensive subsidence of the area has, on the other hand, required the building of dykes, retention basins and polders along the Emscher to control the flow of water and prevent flooding. Due to the elevation of the Emscher subsidiary streams whose water used to flow naturally into it now lie lower than the river, and consequently, their water must be pumped up into the Emscher. One hundred seven pumps work non-stop to secure the flow and the channelling of the Emscher water.

Sub-stream water is pumped into the Emscher's main stream, wastewater is pumped into an underground canal, and an additional 60–110 million cubic metres pit water is pumped out from underground in the Ruhr and Emscher Valleys every year. The high-tech work of wastewater canals, dykes, polders, retention basins and pumps is known in the Ruhr district as the *eternity burden* and *eternity task* (*Ewigkeitlast/Ewigkeitsaufgabe*). Settled in the German Hard Coal Financing Act (*Steinkohlefinanzierungesetz*) of 2007, which is the basis for the discontinuation of hard coal production in Germany in 2018, the largest German coal mining corporation RAG AG is responsible for the contamination effects (*Altlasten*; literally *inherited burdens*) of coal mining in the Ruhr Valley until 2048. While the corporation takes care of carrying out the necessary operations, the RAG-foundation founded in 2007, finances the post-mining tasks, which amount to 220 million Euros annually (Deutsches Bergbaumuseum n.d.). This includes management of the closed mines and land development as well as the eternity tasks. Jürgen Kretschmann (2019) explains that the latter includes pit water control and monitoring, polder management and pit water cleansing. He also notes that post-mining efforts originally focused on minimising risks from the closed mines. Recently, however, the understanding has changed and mines are also seen as opportunities for innovation and energy production, such as through photovoltaic systems and wind power plants on old coal heaps, exploitation of the heat from the pit water, as well as by way of geothermal energy.

Contrary to the encouraging modern story of the clean Emscher water as both a result and generator of progress, this second story digs into the underground of the Emscher and

reveals the enormous infrastructure continuously at work to maintain the progress on the surface. It is a story of the maintenance of the Ruhr and Emscher Valleys. Seen as an engineering masterpiece, this infrastructure of wastewater canals, pumps, polders, etc., resonates with the modern story of an advancing temporality and progress. Yet, the temporality of the infrastructure's powerful high-tech invisible maintenance work is eternal: it promises no improvement, no progress, only endless maintenance of the status quo. As STS underground scholars state is often the case in extraction practices, vast spaces become permanently toxic and degraded, and thus are in constant need of repair (Beckett/Keeling 2019, 217). This story evokes not only a different temporality than the modern story, it also suggests a different ontology of the Emscher landscape. Contrary to the modern story, what counts as a landscape in this infrastructure story is not only what happens on the surface. In this story, the surface is intimately shaped together with its underground. It becomes clear how the renaturated Emscher is not simply the result of a restoration process but is itself a functional part of the landscape maintenance and repair. The thus told and enacted Emscher is not the final result of linear progress but a moment in an endless time without horizon. The infrastructure story is invested less with values of hope than the modern story, but it is indeed linked to the latter. The restored water of the Emscher is interconnected with, and dependent on, its wastewater, pumps and filth. The interconnecting infrastructure also separates clean water from dirty; surface from underground; result from maintenance. This story mobilizes the values of functionality, efforts, work and resources of the enormous infrastructure connecting well-being at the surface with the high-tech engineering maintenance of the underground. The eternity burden allows no modern hope for emancipation; hope is instead related to values of engineering rationality and control of water flows (cf. Beck 1992).

Third Story: the Emscher Ruin

While the stories above present how temporalities, landscapes and values are enacted in different ways in the documents quoted and by the people we encountered in our journey of getting to know the Emscher river, its history and restoration, a third story emerged out of our disconcertment (cf. Verran 2002; Raasch/Sørensen 2014) with what we experienced. We were unsettled by the stories and their performances, a feeling that was also triggered by recent creative contributions in STS and beyond about the Anthropocene: about »arts of living on a damaged planet« (Tsing et al. 2017), about how to live in ruins (Tsing 2015; 2017; Debaise/Stengers 2017); about a possible anthropology (Pandian 2019); about how to stay with troubles (Haraway 2016); and care for soil (de la Bellacasa 2017); among others. In the light of this literature, we became overwhelmed by the unsettling feeling that the efforts, resources and energy invested into overcoming a mining past was anything but justified, anything but sensible, anything but wise: a past which hundreds of constantly working pumps so evidently reveal has not passed.

In her discussions of human-soil relations, María Puig de la Bellacasa (2017, 169) points at the ethico-political predicaments of caring obligations that result from technoscientific endeavours, of which the underground infrastructure of the Emscher might be a prime example. The progressive temporality of the modern story of the Emscher valued attention to increased well-being as well as to the confidence that engineering will solve and thus undo problems of the past. The eternal efforts of pumps, dykes, polders and retention basins, so essential to maintain history as a phenomenon of the past, are set aside in the modern story as unfortunate side-effects attended to only backstage—or in the underground—of the thus purified appearance of progress and emancipation. The infrastructure story, on the

other hand, places the maintaining tasks of the *eternity burden* centre stage. Yet, like the modern story, its focus on problem-solving draws attention away from problem definition, and yet more so from the imaginary defining the post-mining condition as a problem.

There must be a different story to tell, a story that stays with the problem of the Emscher post-mining condition, that enables an alternative imaginary of the Emscher renaturation than as progress or as indispensable infrastructural repair. Both the modern and the infrastructure stories draw attention away from the problem and towards its solution. Inspired by the above-mentioned literature, let us try to tell this story, as a story of life in the ruins:

The river Emscher is located in a ruined valley. The ruin has been shaped through the excavation of ten billion tons of coal from the underground of the Emscher and the Ruhr Valleys. If the eleven pit water management facilities did not pump more than 70 million cubic metres water annually, it would be difficult to mark out the Emscher as a river at all (Henkel/Melchers 2017). The river would be embedded in a large lake district of toxic water, contaminating not only the Emscher and Ruhr Valleys but through the surrounding waterways transporting polluted water to even larger geographic areas. Such a flooded, ruined landscape would leave little space for human and other forms of life.

Stopping the pumps and the drainage of the Emscher and Ruhr Valleys is not an option; neither is it a solution. Nonetheless, this imagination haunts us in our attempt to tell stories about the Emscher. It haunts us just as what we would call the absent-present Ruhr-Emscher Lake District is haunted by a centuries-old ghost that spellbinds water management to relentlessly keep pumping. Donna J. Haraway (2016) suggests we stay with the troubles instead of — or additionally — chasing solutions. If anything, the ghost of the Ruhr-Emscher Lake District is trouble.

What if we stay with this trouble, embrace it, and learn to live with it? Didier Debaise and Isabell Stengers (2017, 19) suggest: »Living in the ruins [...] makes it crucial to drop any nostalgia for an era already over and done with.« The ruin story folds before, now and after into an entangled and ghostly non-linear temporality of an extended here-and-now. It values precariousness, not as a longing for the sentimental, but due to its absence of a promise of stability. When uncertainty comes with conditions of »trouble without an end«, as Anna L. Tsing (2015, 2) puts it, and efforts do not aim for solutions, life gets lived nonetheless. If life in the ruins—precarious as it will be—is nonetheless lived, Tsing suggests that it is due to an »art of noticing« (ibid., 2), which allows inhabitants of ruins to acknowledge what grows anew amidst the deadly ruins.

What neglected sprouts would we notice if we stopped being obsessed with solutions and with making the past, the contamination and the rising water levels disappear; if we started noticing the precarious and ruined life of the Ruhr-Emscher Lake District? We would notice a landscape visibly revealing its shameful history, a temporality in which history and the here-and-now would co-exist, and valuations that would be still to be shaped. How can we possibly know what would arise out of abandoning control? This story suggests a humble devotion to the unknown agencies of the Ruhr-Emscher Lake District, and its historically shaped landscapes and values.

Discussion and Conclusion

In this article, we have engaged with the Emscher and its recent restoration. Our aim was to investigate two questions: What constitutes the ontology of the Emscher and its restoration? How can they be relevantly (re-)imagined?

Our answer to the first question took its point of departure in a core insight of the field of underground STS and post-mining studies: »the underground is not fixed, inert, or lifeless«, as Kinchy et al. (2018, 24) argue. We specified this general understanding by attending to what temporalities, landscapes and values were enacted with the Emscher post-mining restoration efforts. This helped us to tell three stories that distinguish between different ontologies of the Emscher and its restoration: a modern story, an infrastructure story and a ruin story. The focus on *temporality* placed at the forefront how the relations between a before, a now, and an after constituted different ontologies: of progress, of endless maintenance and of history folded into the here-and-now. Inquiring about *landscape* made it possible to confront distinct ways in which environments were accessed: as a surface and platform for well-being, through engineering rationality and through the art of noticing. Lastly, we used the notion of *values* to discuss priorities, desires and recognition brought into existence through renaturation projects: emancipation and desires for self-realisation, control and containment of flows and humble devotion.

The way in which we wrote this article as three separate yet intertwined stories of different and intertwined ontologies of the ontologically one and the same river and its restoration is in itself an attempt to answer the second question about how to (re-)imagine the river and its restoration in relevant ways. The modern habitat (first story), the resource-intensive infrastructure (second story), and the ruins as well as their dynamics (third story) are not merely three perspectives on one and the same river. Thinking through the three storylines activates the varied ontology of the river in terms of the mobilisation of varying actors, knowledges and realities attached to the Emscher restoration. The third story bears our signature more strongly than the first two. This relies on an impulse that is not viable for the *Emschergenossenschaft,* for engineers and planners, but which we as researchers can express: to stay with the problem instead of trying to solve it and make it go away. In all their impressiveness and encouragement, the two first stories are also deeply terrifying: their valued splendour is built on the suppression and control of landscapes and history, and of making the troubling post-mining reality invisible. With the modest intervention of the third story, we want to make visible the agency of landscapes, history and varying valuations; to attend to the problem that is folded into the Emscher restoration. The ruin story is a necessary first step to learn to imagine different post-mining lives. Yet, rather than prioritising the third story over the others we have placed them next to each other in order to acknowledge their co-existence. None of the stories, and none of the ontologies they unfold, can exist without the others. Together they shape the reality of the Emscher.

Nonetheless, we propose increased attention to the Emscher as a ruin because the two other narratives are more dominant and suppress any attention to staying with the problem. Informants marked the difficulty of taking seriously what we call the lake district with nervous laughter, just as it is mainly commented on by agitated bloggers, whose platforms rarely appear on the top of internet search results. Even though the potential reality of the Ruhr and Emscher Lake District is well-known in the area, it circulates mainly in oral culture and in less promoted writings. The lake district exists in the shade of the Emscher showcased as a decisive factor for the Ruhr area's rise from industry to art and culture. The latter imaginary situates the valuation of the post-mining landscape in wider (neoliberal) discussions of cities competing on a global market (cf. Sassen 2011). Instead of addressing our critique at either of the dominating stories, our critique lies in the proposition to treat all three as stories that together enable reimagination. The third story is a device for doing this, it is not a solution. It makes a case for an engagement with frightening uncertainties. With yet unknown arts of noticing that may arise from not proposing a solution and from humble

devotion to landscapes, history and values in their becoming. The first steps may be to attend to local practices around waste, toxicity, landscape, water, soil, temporality, pumping, energy and the values they mobilise, along with enquiries into what new practices emerge out of the fissures in the modern and the infrastructure ontologies of the Emscher restoration. This is where the questions of STS-underground studies about whether »we should dig here« and about »how to reclaim this surface« re-emerge, rephrased and specified as »what are the values of pumping here,« and »how to reclaim landscape and history«? These are well-posed questions, as they require arts of noticing rather than solutions. We believe our ruin story works as a sensitivity to search for answers to these questions in relation to the areas mentioned.

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