

# Ecological Ontologies

Approaching Human-Environmental Engagements

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**T**his issue explores multiple worlds and the multifarious being and becoming of and in worlds, revealing ecological moments of engagement with the environment to scrutinize power dimensions, structural inequalities, and interpretational sovereignty over knowledge production and the constitution and forming of worlds. It brings together ethnographic contributions from anthropology and STS that critically elaborate on a concept of the environment as deeply entangled with multiple ways of being within plural temporalities in multiple localities. In doing so, the contributions urge us to pay attention to a relational otherwise that pivots in transversal (research-)fields to hint at ways to rebel against ontonorms and to intervene politically in predominant human-environment relationships.



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# Introduction.

## Exploring Multifarious Worlds and the Political Within the Ontological Turn(s)

*Kathrin Eitel and Michaela Meurer*

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**ABSTRACT:** *This introduction to the issue presents the political dimensions of research carried out within the framework of the ontological turns that stretch between Anthropology and Science and Technology Studies (STS). Drawing on the concept of political ontology, practical ontology, and the papers assembled in this issue, we embrace the political to be practically sitting transversally in different political fields that foster the constitution of new forms of life as alternative ontologies. In this sense, politics is a critical endeavor to unravel power asymmetries. It attempts to not only illuminate different ontologies, but to realize and co-constitute them. To avoid getting trapped in a mere description of alteritarian worlds and their political power structures, we propose focusing on the largely invisible moments of ontological uncertainties. These eerie moments, which exist in common but non-contemporaneous environments appearing in between something and -time, can provide a learning opportunity for understanding inheritance as responsibility. Their appearance jumbles time and ontological orders, granting us insights into automatic modes of action that normally go unseen. We thus sketch a policy for making oddkins throughout worlds, including its specters.*

**KEYWORDS:** *Ontological Turn, Practical Ontology, Political Ontology, Human-Environmental Relations, Hauntology*

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The Covid-19 pandemic has kept humanity in suspense for well over a year, pushing societies into various states of stagnation and exposing the absurdities of our capitalist world in many places and situations. At the same time, climate change continues to intensify. Large areas of the Amazon rainforest are once again on fire in 2021, cyclones and storms along West African coasts are increasing in strength and regularity. The world sinks in garbage and the ›energy transition‹ requires a further exploitation of soil, body, and labor through extraction. All of these events and phenomenon—in one way or another—relate to specific human-environment relationships over time and space that unveil a slow violence, determining and amplifying the dying of kinds and the overarching advent of new life.

To deal with the various threats posed by these phenomena, it is necessary to continuously and critically envision relationships between humans, non-humans, more-than-humans, and what is commonly referred to as nature, and to unravel stories and encounters between them that are concealed by the machinery of capitalism. Since the 1990s, the social sciences

have encouraged the effort to make the ontological multiplicities of these human-environment entanglements visible in what has been called the ontological turn. Ensuing debates occurred within various disciplines, including among anthropologists (e.g., Descola 1992, 2005; Salmond 2014; Viveiros de Castro 2015, 2017; Kohn 2015; Boellstorff 2016; Holbraad/Pedersen 2017; Ōmura 2019; Tsing 2019) and scholars of science and technology studies (e.g., Mol 1999; Pedersen 2012; Gad et al. 2015; Jensen 2015, 2017, 2020; Jensen/Morita 2017; Pickering 2017). Still, debates about ontology remain vibrant. They occupy a broad domain of contemporary social sciences, but continue to be very controversial (e.g., Bes-sire/Bond 2014; Todd 2016; Chandler/Reid 2020). One line of criticism concerns the supposedly apolitical attitude of ontological studies. They are blamed for getting lost in wildly uncritical descriptions of altered worlds or a fascination with small ontological differences in practice. The lack of perspective in scholarship threatens to obscure the actuality of global power relations and asymmetries linked to gender, race, and class.

This introduction engages with the apolitical critique to shed light on the political implications, dimensions, and potential found in ontological studies. It unravels simultaneously possible answers that lead us to dispersed and eventually eerie places. Here, we ask: how do current ethnographic researchers today address and apply ontological approaches in anthropology and STS? To what extent do these approaches predicate and testify *the political*? And, further, what else can we learn from pasts and futures that might help us responsibly orient ourselves in the world we currently live in?

The contributions in this issue are sensitive to ontological multiplicities that unveil the dimensions through which power unfolds: in negotiations, in stories, in management, and in anticipated practices. Accordingly, we argue that the ontological turn itself offers political potential to the disciplines and scholars that contribute to it or are affected by it. Moreover, we claim that the unraveling of a differentiated perspective on various forms of life can itself be political as studies push alter-ontologies presently into the foreground, laying bare power asymmetries that would otherwise remain invisible. These emerge from the *transversal* fields of politics that go beyond merely local or indigenous loci. We thus plead for emphasis on the situation of multiple ontologies that refer to important forms of being and becoming in this world. The ontos is illuminated in its processual becoming, providing new possibilities for political interventions to shape and form the world we like to live in. We further argue that a close attention to the emergence of unusual interruptions in reality that occur in what we call eerie moments, which take place in common but non- contemporaneity, to illuminate memorials to past histories and hints of future imaginaries. These moments remind us of our worldly inheritance and responsibility as relates to the task of jumbling ontological orders. Making oddkins, that is to make relationships with others, as Donna J. Haraway (2016) urges, is then not limited to relations with different kinds of others. It rather extends its range as far as we are encouraged to make kinships with the uncertainties of the ontos.

We start by briefly introducing perspectives on the ontological turn from its central fields of research, along with their limitations. The second section then explores the extent to which the critique of apoliticism is valid for the entire turn. We therefore briefly outline the approaches of political ontology (Blaser 2009; de la Cadena 2010; Escobar 2017) and practical ontology (Gad et al 2014, cf. Jensen this issue) to present a genealogy for the political ontological turn(s) in anthropology and STS, in which we situate the contributions of this issue. By pinpointing us to sometimes hidden and invisible and sometimes vast and obvious dimensions of the political, these contributions hint at where we might elsewhere find *the political*. In the third and last section, we unravel alternative ways of dealing with uncertainties in the multifarious temporalities of past events and future imaginaries.

## Turning and Twisting the Ontological

Whether the rise of interest in ontological topics marks a paradigm shift in the sense of an ontological *turn* or simply a sharpening of already existing research foci and positions is still a matter of debate (cf. Holbraad/Pedersen 2017). What is beyond question, however, is that the social sciences have experienced »a turn *to* ontology« (ibid. 2017, 8) in the last three decades. Across disciplinary boundaries, studies are interested in the multiple versions of being and the constitution of the world(s). Still, perspectives differ slightly. Anthropology mainly understands the *ontos* (the Greek notion of *being*) as the underlying metaphysical principles of being, expressed in (and thus examined through) empirical phenomena as being representative. STS views ontology as being multitudinous, graspable through its fragments when emerging throughout various sociomaterial constellations. These worlds thus appear in a performative way. While the ontological turn is often understood as being an ›add-on‹ to the material turn in STS, it neatly follows the performative turn in anthropology away from mere focus on the production of text and writing (Cohen 2018, 304).

Starting with laboratory studies (Kuhn 2012 [1967]) and continuing through (post-)actor-network theory (Latour 1987; Law/Hassard 1990; Callon/Latour 1992), studies in STS debate multiple realizations of the world in the context of technology or processes of knowledge production (Latour/Woolgar 1981; Haraway 1988; Law/Mol 2002). For example, this framework examines multiple ways of being that are enacted through and done by specific practices (e.g., Woolgar/Lezaun 2013; Mol/Port 2015). Unlike anthropological attempts, STS studies avoid the *representational idiom* that sees phenomena as representational of a whole culture; instead, it understands the world »more generally as an unpredictably and open-endedly emerging assemblage« (Pickering 2017, 145). Ontologies are as such »ontologies of decentered becoming« (ibid.) in the framework of process ontologies (e.g., Dupré 2014) that decenter dichotomies between human—non-human, and subject—object, stretching out their interests in the processes that bring phenomena-in-their-becoming (Barad 2011) into being, impacting ontological settings. In this sense, ontologies are often understood as a relatively stable sociomaterial constellation. Aptly characterized as an »island of stability« by Pickering (2017), they are part of enduring processes—and thus dynamic and in constant flux.

Pioneering contributions in anthropology by scholars, such as Tânia Stolze Lima (1996) and Eduardo Viveiros de Castro (1996, 2017), originated in the Amazonian context to engage with indigenous ontologies. The authors define perspectivism as the multinaturalistic order of being in Amerindian realities that fundamentally differs from multiculturalist conceptions of the West—the idea that we deal with a plurality of cultural perspectives on a single nature. They thus challenge the philosophical claim of an all-encompassing, universally valid ontology. Instead of this universal ontology, scholars think of ontologies in the plural to distinguish between »modern« and »non-modern« (Latour 1993) or relational ontologies (Blaser 2009); or to categorize animism, naturalism, totemism, and analogism as four key alternate ontological orders (Descola 1992, 2005). These classification schemes should not be misunderstood as static or limited by clear boundaries. Rather, they continue to serve anthropological studies today as a theoretical framework to address a whole range of empirical phenomena. But it is not enough to approach these phenomena in the conventional ethnographic way. Instead, presupposition of the existence of plural ontologies requires an adaptation within the methodology and epistemology of the discipline (Holbraad/Pedersen 2017).

Whether from anthropology or from STS, both of these positions configure insights based on empirical data in an understanding that common binaries between nature—cul-

ture fail to capture the complexity and manifold empiricism exemplarily stated by Donna J. Haraway's (2003) notion of natureculture, captured also by Bruno Latour (1993) among many others (cf. Gesing et al. 2019). But as anthropology aimed to elaborate on empirical phenomena in terms of their underlying alternative metaphysics becoming manifest in ontologically altered worlds, science and technology studies grew interested in the exploration of multiple ontologies as products of (scientific) knowledge processes and everyday practices. Christopher Gad et al. (2015) summed up this division with the terms »epistemologization of ontology« (for anthropology) and »to ontologize the epistemology« (for STS). In this way, Gad et al. criticize anthropology for mainly emphasizing local voices and understanding phenomena as dedicated cultural phenomena and as wholes, being, thus, unable to shift their attention to a symmetrical approach of world-building processes.

While anthropological ontological studies sometimes attest to structuralist paradigms and interpreting phenomena as representative for whole cultures, newer studies are more in line with ideas of process, sociomateriality, and practice (cf. contributions in this issue). They contribute not only to knowledge production within anthropology, but also within the realm of STS that is still a »highly transdisciplinary research field« (Beck et al. 2012, 11, own translation). As the exchange and reciprocal participation in theories, attempts, and methodologies beyond the scope of one's own discipline is a genuine attribute of doing contemporary science, strict boundaries between anthropology and STS thus become fluid and dynamic. Understanding the entanglement between humans, things, and more-than-that (an effort common to both research attempts, though perhaps with varying valuations) as a source of reciprocal influence is worth a second look. Moreover, different assumptions about what the ontological looks like—whether as cultural metaphysics or as relatively stable but unpredictable and open-ended—need not necessarily result in conflict. Instead, these assumptions could refer to a scientific or traditionally divergent understanding about what is and what research should look for. Puzzling the picture together would then involve comprehending the anthropological ontos as being one *mode* of understanding ontologies that emerge out of sociomaterial constellations and assemblages. As Pickering (2017, 141) explains, it is *one* way of being-in-the-world that would no longer appear to contradict the representational idiom that proposes it.

In summary, we understand ontological turn to mean a *turning to* new foci, methods, and ideas, twisted by an onto-epistemology that understands ontology and epistemology as intertwined, seeking to adjust the creation of new analytical attempts, tools, and perspectives. Turns explicitly do not change the complete basic frameworks of disciplines, as Thomas S. Kuhn (1962) has pinpointed regarding paradigm shifts, nor do they supersede anterior ones, providing *the* solution pattern for contemporary needs. Rather, they exhibit a transdisciplinary shift to understanding and approaching phenomena in a more experimental and careful way, occurring in various disciplines and beyond them, thus, becoming turns rather than a single turn (cf. Bachmann-Medick 2018, 17). All of the approaches that are subsumed under one or another ontological turn are part of »a broader Zeitgeist« (Fontein 2020, 13). Driving studies that foster the turn(s) are those that empirically ask what we can learn about the world through the ways that humans and more-than-humans engage with it, or from the multiple ways that these worlds emerge in dynamic and meaningful sociomaterial constellations. The aim of these studies lie therefore in the attempt to unravel the multiplicity and difference of being in worlds (cf. contributions this issue).

The unveiling of these multiple ontologies results from different positionalities within academia, indicating an unequal distribution of voice (or rather, whose voice is heard) in academic contexts. According to Zoe Todd (2014, 2016), indigenous thinkers have talked

about multiple ontologies and more-than-human entanglements for decades. Calling for more attention to quoting and position-filling practices in academic institutions, Todd asks why indigenous scholars and epistemologies have been overlooked in our Euro-Westernized academia world—a world colored by colonial pasts that carry an enduring influence on contemporary and future conditions. We think that science should not stop with highlighting these gaps and shortcuts. Instead, it should take alternative ontologies in science seriously and seek to actively involve scholars from the Global South, BIPOC, and other minority groups. David Graeber (2015, 35) even goes further when he attests the intolerance of the intellectual mainstream towards alternative traditions in science as one of »violent hostility«. The »ontological anarchy« that anthropology seeks to perform by eliciting radical alterity is neither as radical nor as political as supposed. Proposing a realist ontology based on theoretical relativism, so Graeber, is a more radical endeavor by far.

A common aspect of studies that are conducted in one or another framework is that they regularly touch on moments of the political. Yet it is often claimed that the ontological turn and its concepts ignore such moments, as they concentrate on the fluidity and inconstancy by which things materialize and by which they come into the world, into being. This is especially true for those studies emerging from STS that deal with what is commonly known as a flat ontology, which is charged with missing power asymmetries to exclusively focus on the symmetrical relationship that compose ontologies (cf. Ash 2020). However, we think that studies engaging with ontologies can indeed reveal relevant political insights. In light of environmental concerns and the dying of kinds, it seems highly necessary to unmask these political implications and explore the suggestions that such ethnographic research can offer for less violent alternatives of being-in-the-world.

### Tracing the Political

Over the past few years, studies from the ontological turn have often elaborated on political dimensions and implications (Holbraad et al. 2014). In these, politics appears to be a label for the attempt to connect ontological multiplicity with the approach to ontologies, but its traces can be also found in research that seems to not directly deal with it, as we will see. As a chimera, the term ›politics‹ is a favored companion used to emphasize the relevance and meaning of the topics under examination along with its importance to a reconsidered worldview that still lies chained by structural inequalities that traverse space in time.

A thoroughly political approach to ontological multiplicity can be identified in *political* ontology, a framework developed by Mario Blaser (2009; 2013b), Marisol de la Cadena (2010, 2015) and Arturo Escobar (2017). The Latin-American scholars intend to integrate the insights of the ontological turn into analysis of political ecology, and thus make studies of ontological plurality sensitive to global power relations. In doing so, they likewise extend political ecological analysis to include the possibility of understanding local environmental conflicts as expressions of divergent conflicting ontologies (Blaser/Escobar 2016). Political ontology thus seeks to examine the different relational and modern worlds that constitute these conflicts, tracing the hegemonial processes of ontological appropriation (e.g., Glauser 2018; Petitpas/Bonacic 2019). The political moment lies in the competition between these ontologies fighting for interpretational sovereignty and the possibility of shaping future world-making practices with a very unequal distribution conditions and opportunities—and to the benefit of a modern ontology (Latour 1993) of Western institutions and (in these ethnographic cases) Latin-American state agents. It further lies in what Blaser (2013a, 24)

calls a »political sensibility,« that is, the attention and commitment to a pluriverse that must be defended in the presence of a universalistic mode. In this sense, ethnography itself should aim at performing the ontological plurality of the pluriverse instead of an ontologically homogeneous universe.

Casper Bruun Jensen (this issue, 100) criticizes the insistence on actively co-performing indigenous ontologies as »blown up to a quasi-universal level« that opens up a battle arena, which in turn helps reify antagonistic categories as a macro-ontological difference. And yet, in a world of extinctions and capitalistic encapsulation, we insist that it is still important to throw indigenous ontologies prominently into the discourse and make them visible. However, Jensen's point of critique goes further: he is skeptical of the benefits to a reification of a mere dichotomy between the West and the »Others«. Instead, he points to particular platforms of ontological production that are not exclusively enclosed in culturally homogeneous spaces. Ontologies can emerge from so many more constellations, such as encounters between human and non-human actors or infrastructures that can easily cross the boundaries of seemingly homogeneous categories such as culture. These encounterings result in »ontological experiments«, as Jensen and Atsuro Morita (2015, 2017) term them that take place on different platforms such as infrastructures from where new worlds are produced. The »practical« transformation and emergence of ontologies on these sites is then of special interest within the category of a *practical* ontology (cf. Jensen, this issue; Gad et al. 2015). Accordingly, the latter concept provides »a handle for thinking through issues relating to non-human agency and the composition of uncommon worlds« (Jensen this issue, 93), where ontologies are »a lattice or patchwork of uncommon, but not unbridgeable, micro-worlds« (ibid. 100). In concrete terms, practical ontology seeks to understand the dynamic entanglements and interferences between practice *and* materiality that create new worlds; it examines different statements and voices as »situated among many other parts« (Gad et al. 2015, 77). Its political feature lies in the ground that *gives rise* to emerging forms of the political, technological, and cosmological. In this way, ontological politics is an active mode within a process of shaping realities as multiple while these realities are done and enacted (Mol 1999).

Whereas political ontology derives from the tradition of anthropological scholarship with a strong orientation towards the theoretical positions of Latour (1993) and Viveiros des Castro (1996, 2004), practical ontology, however, lies distinctively within the tradition of STS-scholars such as Gilles Deleuze, Félix Guattari and Isabelle Stengers—and carries ramifications for processual philosophers such as Alfred N. Whitehead. Furthermore, the two approaches differ slightly in their analytical focus. Approaches oriented towards political ontology focus on the empirical *reproduction* of certain metaphysical principles in order to critically point to invisible power structures and the ontological dominance of a modern or naturalist metaphysics. Practical ontology locates its interest in the *production* of ontologically multiple fragments of being and of the world. In the political lies a moment where both approaches come together and overlap. Political then becomes a positioning by the researcher its own; it further refers to moments of clashes between different worlds and to an ontological platform on which political negotiations take place.

## The Contributions

The contributions in this issue give insights into river restoration and conflicting co-management of natural resources. They depict daily resistance on tea plantations and reflect on eating and food. In doing so, they invite us to very dispersed places—from India to Brazil

and Alaska to Germany. In their variety, all of the contributions focus on conflicting or problematic aspects in the specific entanglements of human and non-human with the environment. They critically engage with specific ways of world-making while pointing to possible alternatives.

The contributions of Stefan Laser and Estrid Sørensen, of Anna Heitger, Sabine Biedermann and Jörg Niewöhner and of Desirée Kumpf exhibit ontologies as constantly enacted through practices. We therefore situate them in the realm of practical ontology. Their focus lies not so much on the relational difference between diverse ontological metaphysical orders, but on the dimension of practice that emerges continuously in ontological constellations. Stefan Laser and Estrid Sørensen search for multiple ontologies of the Emscher river in their contribution »Re-Imagining River Restoration. Temporalities, Landscapes and Values of the Emscher set in a Post-Mining Environment«. They unravel how particular temporalities, landscapes, and values are enacted together with the Emscher restoration, shaping the multiple ontologies of the river in quite different ways. To depict the river's multi-vocality, the authors unveil three different stories of restoration. These stories present and thus enact the Emscher as a modern river, as part of an infrastructure, and finally as being in ruins. The final, officially untold story points to alternative possibilities of engaging and living in a post-mining reality.

A quiet different empirical topic is investigated by Anna Heitger, Sabine Biedermann and Jörg Niewöhner in their contribution »More-Than-Human Eating. Reconfiguring Environment|Body|Mind Relations in the Anthropocene«. From analysis of three different cases of anticipatory practices (future food design, developments in microbiome science and application, and future food security in Germany), the authors unveil that the boundaries between body and mind, human and non-human, and environment and body are constantly being transcended. The common response to »ontological uncertainty« from the various actors of the three cases is biopolitically conventional and dependent on active ontonorms (Mol 2012). But the modi of governmentality, which takes the form of biopolitical measures that aim to control a singular and political subject, is outdated. More-than-human eating practices unravel the subject as being a multi-species collective that is only metastable in its form to the outer. As such, it is controlled and combatted by technologies that are rather geopolitical—that also impact human entities much as biopolitics also affect the environment. Conversely, »biopolitical and geopolitical interventions have lost their self-evident subjects« (Heitger et al. this issue, 46).

With reference to Mol's (1999) ontological politics, Desirée Kumpf understands ontology as a manipulation of reality in her analysis of multiple ontological politics on two tea plantations in West Bengal and Assamese Dibrugarh. In her contribution »Multispecies Monocultures. Organic Agriculture and Resistance on Indian Tea Plantations«, she deals with different practices of diverse human and non-human actors. Altogether, these practices enact a specific form of agriculture—one that is based not least on authoritative simplifications of plant morphologies and precarious labor. From the perspective of multi-species ethnography, Kumpf focuses on practices of resistance among tea plants and plantation workers. In understanding these practices as a way of doing ontologies, Kumpf recognizes the enactment of ontological versions to be unequally determined. Here, resistance practices situated at unruly edges are handled as places created by authoritative ontologies that dominate world-making processes. In this case, these processes are enacted as simplifications of plant morphologies. The ontological perspective she unveils thus becomes a means of critique: even though plantation ontologies alter, working conditions remain precarious and authoritative ontologies still dominate the ontos of plantations.

Papers by Paula Schiefer and Michaela Meurer deal with political ontology. While Schiefer presents a paradigmatic case of ontological conflict (in the sense of political ontological theory according to Blaser and others), Meurer explores the theoretical interspace between political and practical ontology. Paula Schiefer demonstrates the potential for conflict between different ontologies in practice in her contribution »Negotiating Salmon. Ontologies and Resource Management in Southwest Alaska«. The text pointedly addresses conflicting ontologies between the indigenous Yupiit and state fishery managers when it comes to co-management of King Salmon in Bethel, a Southwest Alaskan village at the Yukon-Kuskokwim river delta. Whereas the latter ontology is based on scientific understandings of reproduction and home as concepts to enlighten the question of why salmon return to their birthplace upstream, indigenous people understand the return of the fish as integral and consecutive to the reciprocal relationship between humans and animals. These different ontologies conflict in management attempts and fishing practices, eventually leading to different strategies for sustainable management. Schiefer uses the empirical example to discuss the extent to which existing hierarchies from colonial settler contexts continue to perpetuate ontological hegemonies today. Deliberations about fishing management then enact the conflict produced from ontological encounters in the form of discussions, criticism, and acts of resistance, further yielding an act of decolonization.

Michaela Meurer similarly addresses an empirical situation of co-management in her contribution »Rethinking Political Ontology. Notes on a Practice-Related Approach and a Brazilian Conservation Area«. The Resex Tapajós-Arapiuns, a conservation area in the Brazilian amazon region, is jointly managed by local residents, state actors, and civil society organizations. When negotiating binding norms for local resource use, ontological multiplicity becomes apparent. Parallels to situations of ontological conflict identified by Mario Blaser are striking. Still, the framework of political ontology fails to adequately illuminate the highly complex situation: local groups are too heterogeneous and the ontological multiplicity of their world-making practices cannot be condensed under one specific ontology. To come to terms with such fluid ethnographic situations within a political ontological analysis, Meurer imports approaches from practical ontology to develop a practice-related design for political ontology based on the notions of plural ecologies (Sprenger/Großmann 2018), ontological consequences, and contextual assumptions.

Finally, Casper Bruun Jensen closes the issue with his contribution »Practical Ontology Redux«, which offers a genealogy of practical ontology. This theoretical contribution is deeply entangled with his own experiences in the elaboration of ontologies. By examining different strands of the ontological turn, he defines the concept of practical ontology as an umbrella term that includes ontology(-ies) in the singular and plural. Practical ontology in the singular is a profoundly open-ended approach to explore how and by whom worlds are performed, maintained, questioned, transformed, or destroyed. In the plural, it describes specific and distinguishable worlds in terms of their composition, maintenance, etc. These are obviously (and crucially) described or otherwise performed by the researcher. Since the researchers are themselves part of practical ontologies, including those that are described, they are not necessarily the only ones through which knowledge about an ontology is produced. Within the framework of practical ontology, we are to »keep up to speed with the pluriverse. And, in doing so, perhaps also play our part in keeping cosmopolitics alive« (Jensen this issue, 102). In the following section, we accept this invitation by tracing and unfolding (cosmo)political attempts and lines within the contributions on hand.

## Transversal Fields of Politics

Contemporary processes, dynamics, and structures of power are complex and multifaceted: they do not emanate from state authorities or centralized institutions alone, but are located at all levels, produced, contested, and maintained by a multitude of actors and a variety of practices. To come to terms with these political complexities and the growing absence of a clear locus for power or personified authority, anthropologists Jens Adams and Asta Vonderau (2014) propose an anthropology of political fields. Such fields are inhabited by numerous individuals, institutions, resources, and bodies of knowledge. These fields are in a state of continuous and dynamic creation. Their formations cut across fields as they form themselves or disappear again.

Since the wielding of power in the formation of political fields often occurs invisibly, ethnographic studies focus on specific, empirical, tangible, material formations and spatial arrangements. These arrangements represent and express specific power constellations and can thus be interpreted as a materialization of political relations (Adams/Vonderau 2014, 9). Ethnography offers a fruitful way to address and unravel these unseen entanglements as it can approach power empirically in two different ways. First, it can disentangle, deconstruct, and split apart the moments and formative processes of materialized power in order to analyze which logics, rationalities, and power relations are inscribed within. This is the path taken by Schiefer, Laser and Sørensen, Heitger et al., and Meurer in this volume. Secondly, arenas of interaction and negotiations can be helpful in characterizing and identifying powerful relations in a political field, as Kumpf elicits with her example of the entangled practices of resistance among planters and plants. As both approaches enable insights into how »spaces are ordered, resources distributed, people categorized, and cultural meanings produced« (ibid., 9-10, own translation), they also unveil negotiations about worlds and supposed ontological certainty. The contributions in this issue indicate that engagement with the formation of political fields has not been exhausted in terms of institutions, actors, resources, and knowledge. They also highlight the importance of questions about ontos and ontologies, about the real and the unrealized. In doing so, they illustrate how the formation of the political always involves wrangling over a certain interpretational sovereignty in the field that defines what counts as true and valid—and what does not. These struggles over sovereignty further implicate the ontological assumptions from which phenomena relating to the human-environmental crisis are understood, handled, and transformed.

Adding to the analysis of locally observable deliberation rounds and political negotiations, the contributions reveal that the political field is no mere matter of geographical locality. This revelation disentangles the empirical cases from being only understandable as bonded to specific groups of actors or to particular locations. The political field is in this way rather realized through *situated* practices in sociomaterial constellations that stretch beyond single actors, pointing to a negotiation and formation process that is located *transversally* between different actors sitting in different places. This is for example evident in the contribution from Laser and Sørensen, when others than those actors and stories that are easily accessible in the living present interfere with the stories from the Emscher river, which clearly transcend contemporary time and place. Political fields are thus formed in transversal places with situated practices, they become material in geographical loci, but are rarely limited to them, as actors, topics, discourses, and rationalities transcend these places. At once entangled and relational, local and non-local, we propose thinking of political fields as transversal and situated among human and non-human actors alike. In this sense, we deal with more-than-human politics.

Opening the scope to holistically grasp more-than-human entanglements necessarily implicates (re)considering one's positionality, vitalizing in this way Karen Barad's (2007) notion of onto-epistemology, which identifies the intermingling between ontology and epistemology. The place from which the researcher derives is intertwined with the researcher's scientific socialization, perceptions of the world, and understanding of what counts as rational, true, and valid—thus impacting epistemic categories and practices. At the same time, the mind and body of the researcher is also permeated by the field. Ethnographic research into ontologies aims not only to unveil different stories, narratives, and artifacts that tell us something about different ontologies *somewhere*, but also to emphasize our positioning and linking in it. This is, at best, an attentive attitude to avoid the »epistemic violence« that is inscribed in Euro-Western academic treatments of the knowledge of others, so Zoe Todd (2014, 245). As such, the researcher is likewise an »ontological co-inventor« of these entanglements that stretch along the field; they are compelled to research in an »emetic« way that aptly characterizes the inseparability of emical and etical research in practice (Jensen 2019, 51). Blaser and de la Cadena (2018) speak in this sense of ethnography itself as a very act of world-making. This highlights the inextricability of the researcher and their field as something that comes into being, as well as points to the political potential within the processes of knowledge production.

In any case, the telling and writing about alternative forms of worlding contributes to the creation of an alternative objectivity. This, in turn, points to the possibility of becoming valid even beyond its own onto-horizon. The enactment and living of alternative sociomaterial ways of being can lead to new, relatively stable forms of life. These become present through a constituent politics that produces »alter-ontologies« (Papadopoulos 2011). Politics that are often identified as being either a form of expertise or institutional participation (as well as the inclusion of the non-human alter and marginalized lifeworlds) preserve accordingly only a constituted order. Understanding politics as a practice that »attempts to create alternative forms that primarily aim to make new socio-material realities« (ibid., 191) refers to the creation and constitution of altered worlds of existence. In this sense, the politics must be *relationally constituent* as it enables the *production* of alternative ontologies that exceeds visible and dominant forms of life that function as a set of constraints against which new possibilities for action need to evolve. They cannot be bypassed because each action and each practice takes place within this precise time-space realm for that exact life form. New forms of life are constituted by a politics that strives for the creation of new worlds (Papadopoulos 2011, 192), as we have seen. As such, the contributions unveil differentiated perspectives on world-making practices. They do not solely highlight differences and power relations. Rather, they are political as they foster the co-constitution of alter-ontologies and thus care about relations in the pluriverse (Puig de la Bellacasa 2012; Blaser/de la Cadena 2018). In this sense, the political lies not only in detecting and marking difference but in the *careful production* of »differences that make a difference« (Bateson [1972] 2000: 178). Academic contributions become political in that they contribute and endeavor to *give form to* alternative world(s).

So, acting politically is not only about the constitution of additional alternatives. Action also directly intervenes in the dominant forms of existing life. The partly abstract deconstruction and tracing of sociomaterial positions and relations from where ontologies are outperformed and enacted allows the researcher to take action through intervening methods such as infrastructural inversion, a research method that interrupts invisible (infra-) structure at concrete cutting edges. These interruptions create synthetic moments of friction, chaos, and seeming disorder (Bowker/Star 1999; Tsing 2005), unveiling opportunities to challenge and contest dominant forms of life. This could involve, for example, drawing

pictures of how to best catch salmon in a repetitive way (cf. Schiefer this issue) or manage plantations (cf. Kumpf this issue). Being political, then, is to willingly disturb ongoing patterns of domination; it is to intervene in powerful moments of negotiation that enact worlds in their ontological constitutions (cf. Blaser 2009). Beyond the text-level, a concrete method of political intervention might involve the creation of chaos in a moment or the provision of a differently ordered space. Another form of intervention is one that intra-actively aims to open up gridlocked concepts and widely accepted facts; it intervenes not in between presumably independent entities and relations but in the incomplete and open becoming of things. Karen Barad (1996, 2011) defines possibilities for political intra-action when speaking of constantly iterative intra-active patterns that, just as Papadopoulos (2011) revealed, perpetuate their form (or pattern, in Barad's terms). A politics of spacetime-mattering aims at questioning, testing, tearing down and, above all, shifting boundaries that limit phenomena to objects (including concepts, for example). After all, »[t]he shifting of boundaries often helps bring to the surface questions of power which the powerful often try to submerge« (Barad 1996, 187). Interventions in iterative intra-action unravel new intonations that render reality differently and thus affect the constitution of the ontos.

To sum up, politics are conflated with an onto-epistemology that produces knowledge and shapes realities in an intertwined relation. This points to the inseparability of ethics, ontology, and epistemology. It further implicates the co-constitution of world that emerges from intra-actions between human and non-human alike. The contributions highlight the decidedly political character of these intra-actions, unveiling the multifaceted, complex, empirical moments and everyday dimensions through which power unfolds. In this sense, the political is a critical endeavor to unveil hierarchies of power, structural inequalities, and patterns of hegemony. It is, further, the attempt to illuminate, realize, and co-constitute alter-ontologies and new forms of life. Through this effort, these studies provide alternatives to current struggles with the anthropogenic effects—from climate change to Covid 19, and from forest fires to waste pollution. Finally, the political refers to an opportunity to overcome a hegemonic reality. The contributions »tak[e] ethnography as a tool to map ontologically distinct positions across more-than-human relations« (Kumpf this issue, 60) that simultaneously embrace and constitute transversal political fields. They are thus part of world-constituting practices, enabling the emergence of indifferent sociomaterial constellations, expressing and reflecting their specific ontological aspects, and reproducing and/or transforming their constitutions. They highlight the possibilities and constellations that often go unseen from a mere anthropocentric angle. By uncovering the ›otherwise‹ and turning worlds upside down, they add a careful sensitivity to questions of onto-hegemonial patterns in the world. As it happens, studies in the realm of ontological turns are anything but apolitical!

Eventually, we are left to ask what future we imagine together. As reality is part of a constant process of negotiation, it takes a repetitive form that impacts what is. Heitger et al. (this issue) touches in their contribution on the topic of uncertain ontologies and control measures that automatically become effective. This gives rise to a question about the temporalities that determine quotidian practices and politics—a question that has gone unrecognized in the transversal fields of politics, at least until now. How do we handle the indeterminate nature and uncertainties of uncanny ontological futures? And what can we learn from materialized forms of life that are outdated, wasted, or indefensible (both speculatively and futuristically) for our environment? Or from those forms that survived, unscathed, in artifacts and anticipated symbols such as heritages and memorials? From those that pop up in dense ontological fog patches as a yet-unrecognized road sign of what will come?

## The Spectered Ontos

The transversal fields of politics have provided a useful tool for unravelling invisible asymmetries and relations. This is true even for the transversal field that stretches across encounters between non-humans, humans, and more-than-humans in a (situated) space. It must thus be relevant to transversal temporal dimensions, too, when we ask what future we would all like to share. The analytical point of entry through which we grasp these transversal fields has been revealed as one of practice. Practice does not simply refer to the spatial field from which it emerges or exists in. It also points to a certain temporal directionality: the way that things, situations, and issues are practiced at present is coupled with both visions of the future and the clutches of the past. While quotidian practices happen in the *now*, perpetuating ongoing situations, imaginations, and things, they anticipate ideas about the future (cf. Heitger et al. this issue). These practices are further built on imagined stories about the past (cf. Laser/Sørensen this issue, 32). Ideas and imaginations materialize in things, artifacts, and stories that endure over time, retrospectively impacting on our daily practices. This is the case when, for instance, weeds grow unruly due to resistance practices by plantation workers fighting for a better (working) future (cf. Kumpf this issue).

Although these imaginaries and ideas often disappear into an everyday routine, they do sometimes appear—suddenly and unforeseeably—in moments that grasp our attention. As the example from Heitger et al. shows, ontological uncertainty projected as future imaginaries is captured and domesticated by anticipatory-yet-present practices, models, measures, and calculations; it is translated into other social realities and contained by biopolitical or geopolitical attempts at control. Ontological uncertainty is thus materialized. Suddenly, the future is no longer fearful and uncanny. It is calculable! The ontos is extended by constellations of sociomaterial components from this world. Drawn into the now of earth's orbit, it is determined, stamped, categorized, and released into discourse again, where it takes hold as a (to some extent) fixed quantity with pre-determined properties. Accordingly, the »frightening uncertainties« of the future (Laser/Sørensen this issue, 32) are frightening no longer as they seem to become controllable. In the comfortable light of what we know how to control, images of haunted futures that cavorted in anthropogenic nightmares emerge as changed. But even when uncertainty is tamed, the example points out the fact that »something« appeared trans-temporally and unexpectedly—much as a specter or a ghost that appears repeatedly, without evidence of a definite beginning or end. It stands in between two parts. It specters.

This is very reminiscent of Jacques Derrida's hauntology—that is, the attempt to open up a science of ghosts. Derrida's (1994) notion of hauntology describes study of phenomena that are haunted by ghosts of the past or a future imaginary. Derrida explored this in the context of determining whether Marx and the ideology of Marxism is still among us. With reference to the idea of haunted places, he concluded that Marxism becomes visible in spectered moments that permeate from relevant thoughts and ideas regardless of their potential success or past failure. Its appearance jumbles time. The present falls apart when specters appear, emerging from the disparate and plural voices of what was and what will come. These ghosts are »neither living nor dead, present nor absent, not belong[ing] to ontology, to the discourse on the Being of beings, or to the essence of life or death« (ibid., 63). They live somewhere in between past and present, life and death. As such, they divest themselves of the logos of the ontos. Here, Derrida speaks of a metaphysical ontology that encompasses the philosophical thought of his time (one initially considered immutable). But in the context of the ontological plurality presented here, it cannot be said that those

very ghosts are ontologically uninhabited—even if the eerie spirits of the past and conjurations of the future, which lie motionless in the in-between, never present as such. Rather, they alter the reality in which they appear as a present event just as they have effects on the ontological composition of the world and, in this way, they also appear as political actors who represent invisible dimensions of power in transversal fields of politics.

Prompting reactions from us in the present, these ghosts exist everywhere at any time, sitting between what is real and what is not. From there, they can haunt us and exude fear. They can also give rise to ideals and promises about what is to come. Heitger et al. reveal how to capture the specters of an uncertain future, while Laser/ Sørensen point to a strand of multiple temporal and narrative entanglements in which one of the storylines of the Emscher river guides the present. In the latter, modern restoration extends from a dirty past that emerges as a specter of the historical present. Here, the incantation of something—whether the assurance of a food future or supposedly certain strategies for the sustainable management of the rainforest (cf. Meurer this issue) or a tea plantation (cf. Kumpf this issue), king salmon (cf. Schiefer this issue) or river restoration—likewise creates reality and forms life. Responses to such eerie moments, in which climate crisis phenomena appear and act with all their presence, are then characterized by a *similar* form of reaction that is bio/geopolitically induced. Through similar and habitual practices, this perpetuates the ontos from which it originates (cf. Heitger et al. this issue). Ironically, those practices provide a home for a certain ontology to which specters do not (directly, anymore, or yet) belong. They impact present practices when they elude a single ontology. This ontology is not exclusive, as Derrida states. Because they walk as ghosts between the living and the dead, they are an *active* part of multiple ontologies.

Imaginations, stories, and artifacts of the past and future actively change reality and existence when triggered by emotions, such as fear, anxiety (but also pride). They thus shape ontologies as dispatches from any time that know neither place nor causality, but belong to land, tradition, and history. Modes of being, the plural temporalities of what was and what will be deterministically subjected, materialize in eerie moments—moments in which we become sensitive to ghosts. This determinacy is expressed in the flaring iridescence of sometimes-visible ghosts that are inscribed in the vivid events of reality, blinking and sparkling in eerie moments. Fear lies in the possibility of a future in which populations die a slow death because of a toxic river, in which indigenous peoples have lost the rights to use natural and spiritual resources on their land, or in which the subjugation of physical labor finds legitimacy in ties to dominant social conditions such as citizenship. It is precisely this sensible attitude that shapes contemporary actions and practices, as illustrated in the example of the research consortium on food security implemented by the German Ministry of Education and Research. When the eerie moments in which they appear are perceived, specters quietly and surreptitiously change in ways that shift our (world-)views on things. This uncanniness and fear, then, inscribes itself. This is less because we are affected by these environmental phenomena and more because, as specters and heralds of a bitter future and past, they make us *feel* a responsibility to tradition, history, and land in terms of our inheritance of their lived presence.

In the context of this editorial, it has become visible that ontologies are reshaped by the sociomaterial configurations enacted and done by the practices and politics of constituents (both those concerned with the production of scientific knowledge and everyday) that (re-)produce reality. Through iterative repetitions of *what is*, practices evoke change on an ontological level. Emerging from multi-temporal sources and simultaneously referring beyond themselves, it is precisely these iterative practices of the political and of being that

escape temporal boundaries. The appearance of specters poses critical questions about reality, demanding answers in the form of modes for action from the living present—answers that derive directly from contested worlds. In this eerie moment, specters are among us. They are part of these sociomaterial constellations that alter reality and embrace effects on worlds. Specters bear witness either as a promising ideal for the future or as a conspirational memorial to plural pasts. This is the »non-contemporaneity with itself of the living present« (Derrida 1994, xviii) because »what happens between two, and between all the ›two's‹ one likes, such as between life and death, can only *maintain itself* with some ghost, can only *talk with or about* some ghost [...]. So it would be necessary to learn spirits« (ibid, xvii). Conscious cont(r)act and engagement with the things that haunt the temporal interstice is then not only a being-with these very specters of the ontological, as Derrida describes it; it is also a *being-in-the-becoming*, a *cooperative being*. Cooperating with spirits involves conscious engagement, a diffraction or deconstruction of an alterity or a similarity from which worldviews (further) emerge and are formed. This is a »politics of memory, of inheritance, and of generations« (ibid., xviii) and here, we rejoin Derrida. As a constituent politics (defined earlier), it can have a transformative effect on ontologies in the context of a spacetime-mattering. Cooperation with the ghosts of the ontos is an act of situating oneself politically, critically, and responsibly, co-becoming in a common but non-contemporaneous environment. It is making oddkins with specters.

### Unveiling Multifarious Worlds to Jumble the Onto-Order

Anthropologists and STS scholars (among others) have intensely discussed questions regarding what the ontos is, when it comes into being, when it is altered, how, and the extent to which it may be able to change at all. This editorial has discussed different political endeavors in and for environmental matters, unveiling the multiple dimensions through which power can unfold in transversally situated fields. Unveiling is able to bust the iterative intra-actions that bond categories, ontonorms, and scientific facts to one another, eventually overcoming the realities of domination that exist today. Multifarious worlds thus function as a corrective to the hegemonial worldviews permeating forms of life from which these views do not originate.

In this regard, eerie moments teach us to grasp moments of friction arising from spontaneous ruptures in reality as something that is complementary to the method of intervention by research that synthetically creates those moments. When specters from past and future temporalities emerge in lived presents, they jumble not only time but also seemingly fixed ontologies. In this sense, they jumble ontological orders. They do so both in the form of their existence, as dispatches from any time and therefore any-ontos, as well as in the way they activate modes of controlling mechanisms and actions that otherwise remain uncritically in the background. In this way, they become tangible for critique.

Specters as a figure in-between in common but non-contemporaneous environments also reveal that environmental matters are heritage. Specters thus impose a historical responsibility that fosters justice by unravelling structures of injustice in situations, places, traditions, and histories with which we are strongly and ontologically entangled. This is what has been called cooperation with ghosts, which sees us enter into a cooperative being in which we altogether become an answer to a politics of spacetime-matterings. In this becoming, nature is no longer separable, but as Donna Haraway (1992, 2003) once noted, a world of embodiment. The spirits we associate with are boundary figures that reside in our

case, between time and ontological order. Building heterogeneous allies with specters can additionally deconstruct ontonomic hegemonies and ontological orders. As we have seen, specters can be captured and miscalculated—but they remain themselves, nonetheless. They are a testament to our mode of production, capitalism, and the subjugation of labor, but they are also entangled through a recurring haunted image with the world through its temporal interconnections. Making oddkins with specters means strengthening nature in its various entanglements.

In the end (or better yet, at any time and any place), we are urged to make entangled relationships with humans, non-humans, more-than-humans, specters, and imaginaries for a planetary future and the stories of our past. In this way of making and cooperating with, we can permeate the world with multi-vocalities, multiple pluriverses, and eerie witnesses in the form of multifarious ontologies. Altogether, these will contribute to a holistic decolonization of knowledge and scientific rationality—and being in the world.

We will continue, in this sense, to knot indispensable ties to others, ours, and oddkins with the aim of jumbling the prevailing onto-order.

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

Stefan Laser and Estrid Sørensen

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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

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 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 (Wittkamp 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 renature 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 (*Steinkohlefinanzierungsgesetz*) 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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# More-Than-Human Eating. Reconfiguring Environment|Body|Mind Relations in the Anthropocene

Anna Heitger, Sabine Biedermann and Jörg Niewöhner

**ABSTRACT:** *This paper is concerned with emergent more-than-human eating practices and how they might challenge received understandings of bio- and geopolitics. After a brief review of the anthropology of food and eating and how its concerns may have to be expanded in the Anthropocene, we briefly analyse three empirical cases of anticipatory more-than-human eating practices: a set of artistic anticipations of future eating; microbiome research and related biohacking practices; and research on future food security in the context of planetary boundaries. We discuss how all three cases make the boundaries between body|mind|environment porous. The ›I‹ of the embodied human subject emerges as multiple—colonised and accompanied by a panoply of microorganisms. How might such a collective be subject to governance and 'self'-technologies? We close by pleading for an experimental para-sitic anthropology that critically addresses emergent forms of bio/geopolitics in the Anthropocene.*

**KEYWORDS:** *More-than-Human, Eating Body, Microbiome, Anticipation, Food Security*

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## Introduction: More-Than-Human Anticipations of Food and Eating

Our planet has now entered the Anthropocene—a geological epoch in which the historical and practical contingency of the reified Western modern dichotomy of nature and culture is re-emerging. Natureculture conjures up deep ambiguities and uncertainties in many different fields and across vastly different scales (Haraway 2008). In this paper, we focus on the field of food and eating. We draw on the notion of anticipation as a defining quality of our times in which the possibility of the ›future‹ is pervasive in our ways of knowing, evoking a variety of practices of speculation, prediction, and a kind of affective state of preparedness for an uncertain future (Adams et al. 2009). With this lens, we discuss three different cases of anticipatory practices: future food design, developments in microbiome science and application, and the knowledge politics directed at future food security in Germany. These three cases of eating configurations reveal how boundaries between body and mind, human and non-human, and environment and body are becoming blurred. We explore how human and non-human actors are mobilised in specific forms of more-than-human eating. And we discuss how in each case established forms of biopolitics are called upon

to govern these emerging configurations. Our line of argument unfolds in three steps: We begin by giving a brief overview of how anthropology has addressed the topic of food and eating with a particular focus on how the body and its inner and outer boundaries and divisions have been discussed. We then present our three case studies.

The first case on speculative body|mind reconfigurations in the field of future food design is based on literature and discourse analysis. The second case on reconfigurations of human|non-human relations in practice is based on ethnographic research in the field of microbiome science and application. The third case on future food security demanding a reconfiguration of environment|body relations in knowledge politics analyses the logic of a major research project aimed at generating new technological approaches to the future of food and eating in Germany. In a final step, we discuss how body boundaries begin to dissolve in these different cases as food comes to be understood not as a bundle of material ingredients but as a scripted technology. This more-than-human eating as a relational practice questions received notions of subject and object and leads us to ask whether interesting normative claims emerge from making new relations through eating. We conclude by wondering what a more-than-human biopolitics may look like and how anthropology might relate to it.

### Ambitions: Food and Multispecies Eating in Anthropology

The current fascination with the topic of food and eating in public and scholarly discourse relates to its literally essential relevance in life, but also its multi-dimensionality and boundary-crossing aspects (Sutton 2014, 133). Food, at least since the later decades of the 20th century, is deeply entangled with political, social, cultural, ethical, ecological and economic issues and embedded in diverse, often conflicting interests. Importantly, this heightened preoccupation reflects the emergence of new regimes of the body and body management as well as growing biopolitical concern with what people eat (Warde 2016, 1). In this postgenomic era, the reactivity of the genome to environments both outside and inside the body (Niewöhner/Lock 2018, 681) means that the human body cannot be sensibly conceived as detached from its surroundings any longer. Our emerging understanding of the human body as populated by all kinds of microbial populations further attests to this shift (Paxson 2008; Sariola/Gilbert 2020). Also, the concern about global environmental change, planetary boundaries and land use competition links food and eating practices to issues of ecological change and degradation on a planetary scale—not to mention human health through increased risk of zoonoses. The security of food supply and distribution and its geopolitical governance, both present and projected into the future, are resurfacing as global ecological and political challenges (Sommerville et al. 2014). Food and eating, in this new configuration, emerge as a set of practices that introduce ambiguities into received modern understandings of subjectivity and objectivity; something that delivers the environment directly into us, relates us to the environment, breaks with our assumed boundaries and turns us into environment. ›We‹, as it were, are emerging as a multispecies organism. In fact, ›we‹ may never have been a modern, singular, and ontologically separated entity in the first place (Latour 1993; Strathern 1988).

Our attempt, then, is to bring together this multispecies body in its ontological uncertainty with the multispecies body of a future that appears ever more precarious and is likely to bring drastic changes into an uncertain present—a future in which our multispecies bodies will emerge related to new materialities, technologies, landscapes, and foodstuffs.

We understand our endeavour as part of a broader attempt to understand changing nature culture relations in the emerging Anthropocene; an attempt that also changes anthropology itself, which has long understood eating mostly as a social practice in which matter appeared only as a carrier of symbolic meaning. Eating in its socio-materiality (Landecker 2010, 2011; Gherardi 2017) is still a rather novel perspective in the long history of the anthropology of food and eating.

Food and eating have served in anthropology as a lens for analysing processes and structures such as political and social organisation, gender, economic value-creation, consumption, production, regulation and governance (Mintz/Du Bois 2002; Welz/Andilios 2004; Bauer et al. 2004). With the different turns in anthropology and the orientation towards embodiment, materiality, and practice, recent research focuses increasingly on dimensions of taste, affectivity and the senses in practices of consumption, preparation and eating (e.g., Pink 2009; Hennion 2007). Following the line of thought addressed by this special issue, some research (e.g., Mol 2008, 2012, cf. Jensen this issue) has sought to promote a practical engagement with the consequences of a relational ontology and the disruption of traditional modern boundaries that had served to consolidate the separation of nature and culture, and related sets of dichotomous categories (mind/body, male/female, self/Other), enabling a transgression of the separation between the natural and the social sciences. An anthropological agenda for researching food and eating arguably needs to include the alimentary and physiological aspects of ingestion (Warde 2016, 58) as well as the collective multi-species effort that the process of ingesting appears to be, resulting in an agenda that facilitates an investigation of the particular (re-)configuration of the very boundaries between what is eaten and what eats (e.g., Mol 2008).

From a more-than-human perspective at the intersection of anthropology and science and technology studies, practices of eating do not consist of passive material foodstuff being ingested by a human subject, but are analysed as assemblages bringing together different human and non-human actors that are caught up in an ongoing process of »objectification« (Miller 2005); or more-than-human subjectification, if you prefer. Thus neither the human entity nor the material stuff considered »food« are essentially preconfigured. They are enacted in the process of eating and thus become multiple over diverse sets of practices (Mol 2012). The same holds for practices of production, of distribution, supply and waste. A single foodstuff can be enacted as different edibles. From a biological point of view, nutrients do not act by themselves, they only become useful in relation to other nutrients and body parts, therefore in relational practice. From a social and cultural point of view, food is constantly transformed as it relates to other foods, people, objects, places, histories, affects and knowledge. Food and eating connects our outer with our inner world. Eating and ingesting is a process of making relations between the eaters' environments and their inner laboratories. This is not only about relating through eating to others as a social process, it is always also about making practical material relations with the world. As the food journalist Michael Pollan puts it:

»We have to think about not just feeding ourselves, but feeding all those other cells that we move through life together with. When you look at food [...] it's not just a thing, it's not just a product. It's a relationship with other species in nature.« (Pollan 2016: Episode 4, min 46)

In this article, we employ a notion of the human body that »does not abruptly end at the outside layer of its skin but extends into its environment as much as the environment extends

into it« (Hoel/Carusi 2017, 8). We are interested in exploring what such thinking can do in the Anthropocene. Since the late 1980s, the study of the human body as it is lived (Scheper-Hughes/Lock 1987; Lock/Farquhar 2007) has emerged in anthropology and beyond:

»Seen as contingent formations of space, time, and materiality, lived bodies have begun to be comprehended as assemblages of practices, discourses, images, institutional arrangements, and specific places and projects. There has been a proliferation of fascinating empirical studies multiplying the kinds of bodies that can be perceived and widening the scholarly vision of human capacities.« (Lock/Farquhar 2007, 1)

An understanding of the body in which its boundary »[...] is no concrete, literal, self-possessed wall [but rather] a self-maintained and constantly changing semipermeable barrier« (Margulis/Sagan 2007, 17) can help us understand how eating is a more-than-human practice always in relation to dynamic environments. It challenges us to continuously situate the body and its biology both in terms of how it is lived and how it is known in historical and practical terms (Haraway 1988; Niewöhner 2011; Niewöhner/Lock 2018). The body as practiced is necessarily a body multiple (Mol 2002) with the stability of embodied phenomena across practices emerging as a phenomenon to be explained.

Thus with our three cases we venture beyond a human-environment interaction perspective within which boundaries and modes of interaction shift. Rather we consider phenomena such as bodies, microbes, environments and foodstuffs as always emergent in an ongoing process of *becoming* (Deleuze/Guattari 1987) that is best captured through process ontologies (Dupré 2014). By process ontology we refer to any metaphysics that considers events and processes the basic building blocks of reality rather than stable substances. Process ontologies underpin some feminist critique (e.g., Barad 2003), process philosophy (e.g., Bergson or Whitehead) and a philosophy of becoming (Deleuze/Guattari 1987). Process ontologies decentre subject-object distinctions as both contribute to processes through which subjects and objects come into being in the first place. This differs markedly from an understanding of active subjects giving form to or making sense of passive objects (cf. Eitel/Meurer this issue). In our case then, eating is not about an active human subject devouring passive matter. Rather, eating is a process through which subject and object are configured and reconfigured, for example as a multispecies self-incorporating multiple Other. *Thinking through eating*, such as Annemarie Mol (2008) has brilliantly shown with the example of eating an apple, and in particular thinking through more-than-human eating, helps us to challenge the ontological politics of our research, of our theories and our methodologies. It enables us to move towards an increasingly embodied research practice (e.g., Bartos 2017). For food may not only be good to think with, but also good to eat (Warde 2016, 57). Unpacking the materiality of what we taste, chew, swallow and digest, we propose an understanding of food employing Madeleine Akrich's notion of the script (1992): Foodstuffs today are increasingly engineered or designed substances that are meant to shape our bodies and some of their permanent symbionts in specific ways through ingestion.

It is important to at least note that the relational understandings we draw on do not originate in recent developments of Euro-Western academic narrative (Todd 2016, 8). Various of these recent ›realisations‹ in Western academic practice of relationality and of the agency of other-than-human entities have long been and continue to be lived reality in many parts of the world. They have been pushed to the margins of academic discourse with the same ignorance with which Western political economy and power have marginalised indigenous and other communities that now bear the brunt of the effects of this colonisation

rooted in ›modern‹ separations of nature and culture (Kopenawa/Albert 2013; Kohn 2015). Thus, it is crucial for anthropology to not ignore the particularity of ›modern‹ ontologies that have brought about the Anthropocene, to resist the all-too-easy universalising of bodies and modes of relationalities, and to enter into dialogue with voices from outside and from the margins of academia.

### Case I: Reconfiguring Body|Mind Relations Speculatively in Future Food Design

This case is distilled from a literature and discourse analysis on eating practices conducted by Anna Heitger as part of her dissertation research with the Food4Future consortium. We take the latest food report from the London-based experimental food studio »Bompas & Parr« as one example of a wide range of similar anticipatory practices that frame designed food as the means of new forms of self-management. The example of an imagined future sharpens our sense for possible trajectories when we set it against actual current practices in the next two cases.

The self-proclaimed predictions for the year 2020 include, amongst other things, the use of gut bacteria from »carefully selected donors, who boast [...] peak mental and physical conditions« to produce »healthy mind inducing products« via fermentation processes (Bompas & Parr 2020). This idea rests on emerging knowledge about the gut brain axis and on current practices of faecal microbiota transplantation used to treat bacterial disbalances in the human gut (see next section for more detail). Bompas & Parr illustrate this vision with a close-up photo of the skin of a female abdomen being twisted by two hands as if to suggest a physical engineering of the gut—an unusual sight in an age of photoshopped perfect female

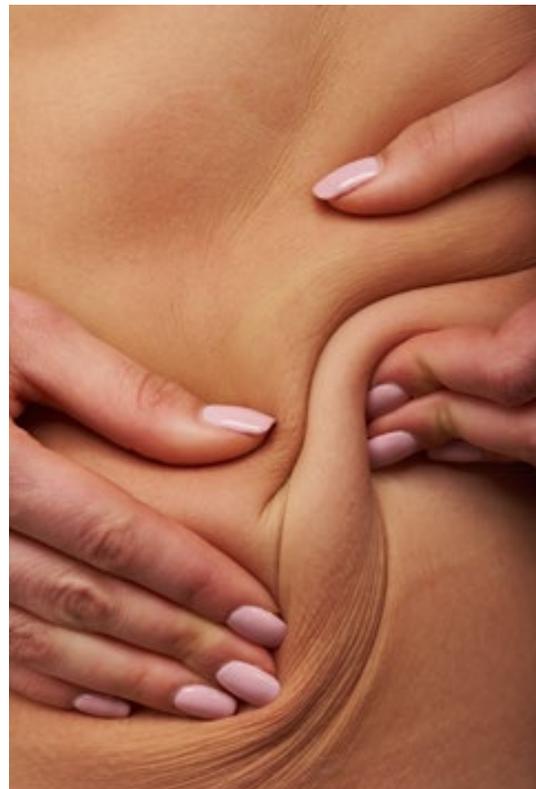


Fig. 1 »Prediction 3: Gut Brain Axis Fermentation« (Bompas & Parr 2020)

bodies. A strange ambiguity arises from the mismatch between the need for fit, healthy and intelligent donors and the contortion of the gut to reach the objective of mental health.

Bompas & Parr's rendering of the body as a site of intervention is plausible because it is concordant with current discourses of health and practices of dieting, fitness, and self-optimisation and -improvement. The materiality of the body emerges as contingent and optional subject to purposeful alterations. This articulation of the body as subject to be optimised is only plausible, because it arises in an historical conjuncture within which a specific imperative of being ›healthy‹ has emerged in medicalised discourse and related technologies of the self (Heitger 2019). Measurements such as the Body Mass Index (BMI) or the calorie act as important tools in these practices, generating links between body weight, physical constitution, fitness and food intake incorporated within a specific biopolitics. Bompas & Parr's vision of altering the self through ingesting engineered foodstuff pushes to a new level the way in which food intake, as well as the selection of foodstuff, of material quantities and qualities, the practices of preparation, the rhythms and intervals of eating emerge as subject to individual choice and an all too well-known biopolitical normativity.

Yet Bompas & Parr go further in their anticipations of the future of food and eating: In their vision, science will not only explore the ways in which particular foodstuff affects human mental health via the metabolic system. They also envisage that our dreams and dreaming habits will become subject to eating interventions:

»Perhaps in the future, world leaders and inventors will eat certain foods to enhance their dreams in order to come up with inventions that could save the planet from a climate crisis.« (Bompas & Parr 2020).

While the train of thought might seem peculiar—to be imagining the invention of dream-enhancing foods that would then allow to be thinking (or rather, dreaming) of how to solve a crisis that is already a crisis in the very present (and has been for some time) —, this idea exhibits important elements of the logic governing dominant techno-utopian visions. The present precarity of those affected by the very problem the designers claim to set out to solve is disregarded. Instead, the agency of conceiving and executing the necessary actions to »save the planet from a climate crisis« lies with »world leaders« and »inventors«. Whereas in daily life mere mortals are interpellated as biopolitical subjects consuming food-as-nutrients in responsible ways, world leaders eat to dream the path to fulfilling the anthropocenic calling: human rule over nature.

Such anticipations illustrate an important feature of food enacted in futuristic visions: The incorporation of a novel substance with novel characteristics and potentialities evokes, or is imagined to be evoking, a new subject and a new, altered and already futuristic body. In our notion of scripted food, different bodies and different multispecies selves emerge through literally *eating the script* written and built into food, shaping our multispecies body from the social and cultural to the very molecular level of our bodies. These dimensions are not separate but intersect in ways yet unknown as food is incorporated. Incorporation in this sense implies the capacity to alter the body's »inner laboratory« (Landecker 2010) and thus also affect mental capacities in intended but most likely also in many unintended ways. Eating in this sense is not only about incorporating a single substance that is active in different ways through processes of pasteurisation, sterilisation or fermentation for example, but is about incorporating a complex and scripted technology. As such, it extends the body into its environment, as becomes visible when we ask how eating differentially scripted food can potentially alter environment-human relations in multiple ways: Who are the embod-

ied multispecies selves emergent from such anticipatory projects? How do different multispecies selves emerge, and how are these differences configured? Innovations that try to push further and make bodies ›plastic‹ through biotechnological interventions are always embedded within wider epistemic and biopolitical projects (Landecker 2010). The narrow focus on edible substances and their effect on the immediate interaction of body-mind-food in techno-utopian projects does not foreground these projects. We come to some of these wider issues in our third case. Let us first turn to a reality check for eager techno-utopists and delve into current practices of microbiome research and application.

### Case II: Reconfiguring Human|Non-Human Relation in More-Than-Human Microbiome Practices

The alarming increase in non-communicable diseases such as allergies, heart conditions, and diabetes, has brought a growing concern and a proliferation in research about the relation between food and health (Sanabria/Yates-Doerr 2015). Globally today, the undernourishment of about 690 million people (and rising again due to the current pandemic), goes hand in hand with a high prevalence of obesity (FAO 2020). Global health agencies are making an effort to foreground and spread knowledge about the link between eating and health (Roberts 2015; Sanabria/Yates-Doerr 2015). Scientific and public concern about healthy eating is increasingly shifting its attention from the individual body to a panoply of subjects related to the production and consumption of food, and the human, technological, and microbial actors involved in it (Sanabria/Yates-Doerr 2015). A rapidly growing field in this research on eating and health is the study of the human microbiome and its relation with nutrition and health. And this brings us to our second case: The more-than-human microbiome. As part of her doctoral research Sabine Biedermann followed ways of *doing* a human microbiome, both as an epistemic object and a socio-material entity, by analysing scientific journal articles and health blog posts, attending microbiome talks and research meetings in Berlin and the Boston area, attending a pharmaceutical microbiome drug development summit, and engaging with people tinkering with their microbiomes outside of institutionalised laboratories.

Research on the microbiome negotiates new edibilities and is translated into new understandings of food, taste, and dietary guidelines. On the one hand, microbiota research shows that ›we‹ are not only feeding the ›human‹ part in us, defined as what is composed of human cells, but also ›our‹ microbes. On the other hand, it makes clear that we are also eating microbes and that microbes are also eating the food we eat before we eat it (e.g., Benezra 2016; Greenhough et al. 2020; Paxson/Helmreich 2014), which is most visible in fermented food. Caring for the microbiome in order to sustain and maintain health involves a close inspection of the diet and of medical drugs as well as of commonplace life exposure to ›the environment‹ in general: ›people should be aware, that when something is labelled as completely safe, that might be so for the humans, but not so much for the microbes.« (Spector 2018) Caring for our microbes means caring for relations between other beings, substances and the environment as these relations shape ›our‹ microbiome. We do not exist extracted from what seems to be outside of our bodies, but are actually deeply entangled with it. The work of Margaret Lock and Hannah Landecker for instance shows how the boundary of the skin, previously thought as a clear delimitation between body and environment, disappears when thinking with/through epigenetics and the microbiome (Lock 2018; Niewöhner/Lock 2018; Landecker 2011). Hannah Landecker and Chris Kelty, as they

discuss the agency of short chain fatty acids and metabolisms, talk about »[...] entities that breach certain assumed distinctions between outside and inside« and that might encourage a remapping of »sense and viscera, environment and gene, context and content in contemporary life science« (Landecker/Kelty 2019, 55). Microorganisms are these kinds of entities, making it clear how we are always also already environment and how the perceived material environment operates within us. Treating the body as multi-species kin (Haraway 2016) then requires a new ethics of eating as a relational practice. It requires ›us‹ to think of ›our‹ microcompanions and what might make them thrive or starve. Who benefits from our eating might have to be subjected to a non-anthropocentric analysis:

»If the body is sensate through and through, and not a matter of surface and depth in which everything that crosses the boundary is converted from external to internal with a consequent loss of agency and identity, then paying attention to how metabolism converts and interconverts seems an appropriate locus of understanding the mutually transforming meeting points of biology and society.« (Landecker/Kelty 2019, 64)

Microbiome research also makes evident that the human body cannot be separated from ›nature‹ and that there can be no nature/nurture divide. Both make each other constantly in a microbial mediated body. And as the body is in constant change and highly unstable, a universal body cannot exist. No two people are the same when looking at the microbiome. We share 95% of our genes, but only approximately 25 percent of our microbiome, so we are very individual when it comes to our microbiome (Spector 2018). The microbiome is not a well-defined and delimited organ, organism or ecological system with specific functions but is fluid, constantly mutating in materiality and meaning. This makes it extremely hard to come to standard microbiome therapies or replicable human experiments. As a researcher in the Boston area put it: »[...] most of the studies on gut microbiota are made on lab rats, isolated from the environment and social interaction«, and »lab-mice limitations are being widely studied now.« (Fieldnotes SB 16.10.2019) Another common statement at microbiome talks is that »we don't really know what is going on« and that researchers are »wildly speculating what the answers are« (ibid.). These are all signs of an emerging field of research struggling to develop appropriate and standardised model organisms, experimental systems, and conceptual tools.

Yet this vast uncertainty of an emergent scientific field does not stop microbiome enthusiasts from trying to engage with their microbiome to optimise their health or cure rare ailments. In the following we go into more detail on a case from the field where a person that became an expert in feeding, and starving, his microbiome to heal a skin condition experiments and tinkers ›in the wild‹ as a viable alternative to allopathic medicine, learning to sense and collaborate with his microbiome.

While scientists seeking precision, predictability, reliability and replicability are troubled by the versatility and restlessness of the microbiome, do-it-yourself (DIY) practices outside of scientific labs develop very different ways of tinkering with the microbiome embracing its vivid nature and encouraging multi-species encounters. The DIY community cultures or starves microbes for purposes of health, taste and food preservation. There is no rigorous tracking and testing, but experimentation is encouraged. The idea is not only to culture the bacteria in a ferment, but to create an environment that allows beneficial bacteria to thrive inside and outside of the body and that reduces the number of ›bad‹ ones. Humans learn to attune to microorganisms, microorganisms multiply and transform edi-

bles, waste, bodies and soil. There is collaboration, one is not working against the other, but organisms are working with each other. If the bacteria refuse to collaborate, health is not achieved. And for the bacteria to collaborate, the environment has to be probiotic. The human has to collaborate with the bacteria, giving them the necessary means for survival and keeping them safe from hazards.

An example of this is the SIBO Diet (Small Intestine Bacterial Overgrowth) that avoids FODMAP's (Fermentable Oligosaccharides, Disaccharides, Monosaccharides, and Polyols), very popular in alternative health blogs (e.g., Wells 2016; McCoy 2018). The idea of this diet is to starve bacteria which are growing in the small intestine when they should only be in the colon by not giving them what they like, namely the FODMAP short chain carbohydrates and sugar alcohols that are poorly absorbed by the body. Anecdotal evidence suggests that this can heal a number of conditions that affect us—from the human skin to the human mood.

Leonard<sup>1</sup>, a 38-year old male with a recurring skin problem, followed the SIBO diet for a month to »heal« his skin. He has tried soaps, creams and has seen different doctors. He is disappointed, because nothing helps, and he also has the feeling that doctors trained in allopathic medicine do not take the time to explore options or take his concerns seriously as long as it is not a life-threatening issue. He has conducted some kind of swipe test of the skin with a doctor while he was visiting Chile and the results said that there is a certain kind of microorganism overgrowing on his skin. He explains that it is the same one that causes rosacea and talks about »them« as tiny creatures that have dwelled on his skin and have been reproducing. When he takes antibiotics, it goes away. So the logical explanation for him is that antibiotics kill the microbes and therefore clear his skin. But they come back after he stops and he cannot be on antibiotics all the time, he says. This got him to look more into bacterial overgrowth in and on humans and that is how he learned about special diets that »starve« the »bad« microbes so that a healthy microbial balance can be restored.

He has installed an app on his smartphone that classifies every foodstuff into red, orange or green. He can eat as many green foodstuffs as he wants, needs to avoid the red ones altogether, and can occasionally have orange ones. By doing this, he is attempting to hack his microbiome, starving bacteria that are growing where they should not, in his case his skin, and then reintroducing beneficial bacteria by eating ferments. While he follows this diet, we talk about changes on his skin, his digestion, mood and energy. We share meals and comment on the ingredients and how they affect the microbial communities in his body. He says something »funny« has been happening in his stomach the past few days. His bowel movements are different and there is movement and noise in his abdominal area. We playfully talk about the microorganisms dying inside of him and putting up a fight as they starve. »Give me carbs!«, he says in a funny voice. In addition, he is taking »angocin«, a plant-based antiviral and antimicrobial. His skin is looking good. Yet he is afraid his condition will return as soon as he stops the angocin, just as it happens when he stops antibiotics. He also does not intend to follow a SIBO diet for the rest of his life. The idea is to go on it for a month or two, then slowly reintroduce the »forbidden« food and »recolonize with sauerkraut and kombucha« (Fieldnotes SB 27.03.2018).

In a way, he is beginning to learn how to sense his microbiome, to attune himself to microbial activity in and on him. So what he has been feeding has not been the human embodied subject, but the commensal microbes while starving the pathogens. And what he was eating was not only foodstuff, but edibles made edible by microbes. Acknowledging microbial life in food and in himself slowly changed his body image and perception as well as everyday eating and cooking practices. He does not have any scientific proof that the changes

in his microbiome are occurring and considering the current status of the science on these processes, he will not have any hard evidence any time soon. Yet he operates—not without a certain rigour — a biofeedback process by controlling intake and sensing changes in his body: the smells, the sounds, the skin texture. They all transform as his diet shifts. And this he attributes to these tiny creatures he talks about. Acknowledging his multi-species body leads him to experiment with new practices of food and eating.

### Case III: Reconfiguring Environment|Body Relations Sustainably in Future Food (Bio-)Politics

Our last case takes us into a major research consortium funded by the German Ministry of Education and Research<sup>2</sup>. The interdisciplinary project Food4Future (F4F), launched in 2019 for five years in the first instance, aims at generating new approaches to the future of food and eating in Germany and at developing new technologies for food production as well as new foodstuffs that could be eaten in the future. Particular about its approach is the postulation of two future scenarios: a no-trade scenario where food production needs to occur more or less exclusively in Germany itself; and a no-land scenario that assumes that land cannot be used for food production any longer. These scenarios have been selected as tools for imagining the future and, particularly, for realising interventions in the present. Discussions shift between talking about the future imagined in these two scenarios as a possibility and talking about interventions in the present, revealing the project's inherently anticipatory mode.<sup>3</sup> The ambitious project is in its early stages. We are interested here in the rationale that underpins the project as well as much of the ministerial funding stream as a whole. The key issue is food security for Germany in an increasingly uncertain global future. Already today, we see major changes to land use practices and agricultural production due to rapid global environmental change, first and foremost climate change.

The rationale comprises two distinct biopolitical dimensions that become closely related through the specifics of the project. The first dimension targets food production. F4F tries to optimise a set of edible species, namely locusts and algae, to improve their adaptability to a range of environmental conditions and to increase their nutritious value to humans. This might be considered a form of biopolitical form of preparedness that is not aimed at political subjects but their organismic environments, though of course the ultimate concern is anthropocentric. It is a form of molecularising the environment (Landecker 2011), i.e. understanding the environment predominantly as a source of active ingredients for human health and well-being. The second biopolitical dimension of the F4F project targets the human subject. The project aims to develop a self-tracking app as an intervention into food consumption habits that need to become adapted to the emerging concerns about global environmental change. Similar to other already existing self-tracking apps that aim at regulating processes of input and output of a mechanical body via measurement and data analysis, this app rests on a notion of the body as a site of intervention. The app is meant to support individuals in navigating eating preferences and practices. Yet rather than being aimed at individual health, the app also addresses the sustainability of eating practices. It is envisaged to help individuals adopt eating practices that help to navigate the uncertainty of food consumption in the Anthropocene, avoid overconsumption and restrict oneself to only the nutrients necessary for survival. Food security for Germany can only be guaranteed for uncertain futures if Germans learn to eat sustainably, i.e. if they eat foodstuffs that can be grown on a planet inside planetary boundaries. Eating in and for a safe and just operating

space is something that needs to be learned and it cannot be learned through embodied aesthetic experience alone (Rockström et al. 2009). It involves cognitive learning, acquiring new habits and accepting responsibility not only for oneself but for the environment both locally and on a planetary scale.

Typical for late liberal societies, sustainable eating is addressed not as a collective or even more-than-human concern, but as a matter of individual choice in an optimised decision architecture. The inscription of responsibility into a self-tracking app envisages autonomous actors taking responsibility for their choices of the right foodstuffs that are available through a bioengineered environment. Individual health features as a co-benefit of such an intervention. It provides additional motivation should people fail to be able to show face to an abstract planet or distant kin that demand and deserve solidarity (Haraway 2008).

### In Conclusion: Ontonorms of a New Bio/Geopolitics?

Our three cases all deal with food and eating. They demonstrate how in this domain modern distinctions between body-mind, body-microbial environment, and body-planetary environment are becoming troublesome. Scripted foods, unruly microbes and planetary boundaries all involved in eating as making relations are best understood as hybrids in the Latourian sense. They question the human skin as our last line of defence (Bentley 1941). They force us to consider our actions in terms of their effects on the planet and on the microbial—something so far beyond the human scale (Niewöhner/Beck 2017) that it takes major research infrastructures to even begin to understand what this may mean.

We believe our cases are typical examples of the kind of trouble that awaits us in the Anthropocene. The dominant political economy of the last fifty to a hundred years is giving rise to an anthropogenic biology (Fitzgerald et al. 2020), both at organismic and at ecosystem level, if you still care to hold on to this distinction. This is giving rise to an anthropogenic bios for which our biological knowledge is badly equipped. Process ontologies that can help to situate biologies historically and practically are only now re/emerging and have certainly not reached mainstream science. Hence violations of modern boundaries spell trouble. Staying with this trouble (Haraway 2016), however, is a difficult task.

In our cases, almost all actors are reverting back to established modes of trying to gain control over emerging ontological uncertainty: Food designers are invoking images of world leaders—picture white males—that explore new technologies to solve the world's problems. The relationality of the naturally engineered gut-brain-dream axis is treated playfully and creatively, but only so far as not to question received hegemonies. Science as the ultimately modern practice is overwhelmed by the sheer complexity of multi-lateral eating. It sticks to its guns hunting down causality in model organisms and snapshots in time. The biohacker might seem like a tinkerer at first, yet it is also his acute suffering that makes him take risks and experiment on himself in ways that mimic science without resources or training. And researchers and funding bodies in Germany revert to established biopolitical modes of governmentality in the face of fundamental uncertainty. It is hard to justify experimentation and tinkering if you are accountable in very straightforward terms or if you are suffering.

Unsurprisingly then, perhaps, in the face of ontological uncertainty, all our cases enact well-known ontonorms through their practices. We borrow this term from Mol (2012) to refer to the dominant normativity that is enacted through relating heterogeneous agents in the practices of eating and food production: enhancement, health, and sustainability main-

ly pursued through technologies of the self, modern understandings of human-environment interaction and national modes of governmentality. These are well-known biopolitical registers. Yet the cases also begin to suggest how anthropocenic relationality exceeds and escapes these approaches of biopolitical governance.

Eating practices in the Anthropocene demonstrate how body-mind-environment relations are being reconfigured. Such more-than-human eating is hard to fathom in biopolitical terms. The subject of biopolitical governance is the embodied human subject capable of self technological management and is the population in need of regulation. They are targets for interventions and as such clearly demarcated from their environment and from other species. As it turns out, however, the eating subject of the Anthropocene is a multi-species collective. The organisational structure of this collective is anything but clear at this point. It appears metastable insofar as it is capable of preserving some sort of form through time, able and willing to offer relatively stable interfaces to an ›outside‹. Yet underneath this metastable form significant movement is persistent. How does one address such a multispecies collective? How does one intervene into it? Governmentality might work for agents capable of understanding and managing themselves. Understanding oneself, however, becomes something altogether different if the multi-species collective does not have a material, cognitive and ethical centre.

What then might the biopolitical governance of more-than-human subjects look like? Would it not be a form of geopolitics? Geopolitical interventions into the non-human environment follow very different logics. From the hygiene and social medicine policies of the 19th century through drenching African landscapes with DDT to proliferating genetically modified mosquitoes in Latin American cities to spraying dense urban quarters against SARS-CoV-2: Geopolitical interventions directed at non-human life and territory operate in very different ways from their biopolitical counterparts. They do not understand their targets as reflexive political subjects, but as commodified nature. So governance through crude command and control seems apt. In the Anthropocene, however, geopolitical interventions are always also biopolitical interventions as they affect human companion species. The externalities of our political economy feed directly into an anthropogenic biology which does not stop at our skin. Eating is only the most obvious way of making relations.

Our cases of more-than-human eating bodies stand exemplarily for many similar cases—some of which are discussed in this special issue—, when they demonstrate how geo- and biopolitics become entangled. How multi-species meta-organisms become subject to governance is as yet unclear. What is clear is that biopolitical and geopolitical interventions have lost their self-evident subjects. Biopolitical interventions into human subjects are also interventions into environments; geopolitical interventions into landscapes and territory are also interventions into human beings. Our cases also demonstrate that a bio/geopolitics has not emerged yet. We have reported practices in an anticipatory mode, i.e. practices that lead to decisions today on the basis of futures imagined in very specific ways. The response to these futures is conventional and entails the well-known biopolitical repertoire. Anthropological inquiry in the Anthropocene should watch the increasing entanglement of bio- and geopolitical modes of governance carefully. The multiple uncertainties involved in this development present important sites of intervention. The shape of new forms of governance will critically depend on the kind of knowledge produced to understand multi-species organisms and more-than-human practices such as eating and fermenting. This is an opening for some creative and perhaps even non-metaphorical parasitic ethnography (Marcus 2000) that keeps such practices open for careful experimentation.

## Endnotes

- 1 Name has been changed to protect the identity.
- 2 Anna Heitger and Jörg Niewöhner are part of this consortium.
- 3 Interestingly enough, the scenario of a pandemic threatening supply chains and routines of food consumption that became our present, was barely mentioned during a visioning exercise only weeks before the Corona situation began to unfold.

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# Multispecies Monocultures. Organic Agriculture and Resistance on Indian Tea Plantations

Desirée Kumpf

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**ABSTRACT:** *This article investigates the multiple ontological politics of agriculture on Indian tea plantations from a more-than-human perspective. Plantation agriculture is an ontological politics that enacts authoritative simplifications of plant morphologies and is performed by precarious labour. Each plantation also comprises multiple other practices: the efforts of planters to reform the ecological relationships in their tea fields through organic cultivation techniques, the resistances of workers and supervisors to their working conditions, the unruly growth of tea plants, and the interventions of various other non-human species. The article uses multispecies ethnography to sketch how organic cultivation, labour resistance, and non-human agency negotiate monoculture production. This approach probes the potential of ontological perspectives to evoke multiple variations and minor contestations, while also accounting for the persistence of dominating ontologies.*

**KEYWORDS:** *Ontological Politics, Resistance, Multispecies Ethnography, Plantations, Organic Agriculture*

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As supervisor Nayan led me through the vast fields of the Darjeeling tea plantation where he worked, he often paused to inspect particular tea plants along the monotonous rows of near-identical bushes. Sometimes he bent down to pluck flowers or pointed out particularly beautiful trees. Enthusiastically, he would show me a fungus that grows on the underside of tea leaves and improves their taste, or he would demonstrate the excellent soil quality of the fields by rubbing a lump of earth between his fingers (Fieldnotes, 22.11.2016).

On organic tea plantations such as Nayan's workplace, a variety of non-human species help to produce hyper-productive tea monocultures. But their actions and interactions are closely monitored: Nayan and his colleagues are required to make tea plants and their companion species interact according to management incentives, and to keep unruly behaviour in check. And as much as Nayan is fascinated by his daily encounters with non-human life, they also exhaust him. Most of the time, workers and supervisors are already overworked, and since they do not benefit from the additional value that organic production creates, they sometimes resent these additional tasks of care and often avoid them.

When I first entered India's boundless fields of tea in 2016, travelling to the plantation regions of Assam, Darjeeling and the Nilgiri mountains, I was intrigued by what seemed to

me paradoxical projects to cultivate plantations through organic agriculture, for I understood plantations to be industrial monocultures that disrupt diverse ecosystems. In anthropology, plantations are discussed as markers of colonial and capitalist projects to turn living landscapes into resources through precarious labour. Starting from here, I wondered how organic cultivation interferes with what plantations are or might become. Therefore, in this article, I turn to ontology, since this literature is equally concerned with »the conditions of possibility« (Mol 1999, 75), of how the world (or, in this case, agriculture) is open to be made otherwise. At the core of current attention to ontology is the proposition that, if the reality is constantly re-enacted in many different ways, there are always options for interference and transformation. But rather than adding another hopeful account to the anthropological repertoire of alternatives, I am concerned here with the persistence of certain dominating ontologies within (or in spite of) ongoing change (cf. Eitel/Meurer this issue).

In this article, I analyse plantation agriculture, organic cultivation practices, lively non-human agency, and labour resistance as multiple »ontological politics«, defined as sociomaterial practices through which »reality is transformed and where new ways of doing reality are crafted« (Mol 1999, 75). Ontologies become political through attempts »to make some realities realer, others less so« (Law 2004, 67). Analysing my ethnographic material, I track these various strands of practices and ask how they rub off each other. How do planters (plantation owners) attempt to implement organic cultivation and engage in crafting new versions of tea plantations; and how do workers and supervisors resist their attempts? Specifically, I emphasise world-making practices beyond the human (Haraway 2003; Kohn 2013), for instance the botanical ontologies (Daly et al. 2016) enacted by tea plants. Thus, I follow the many intersecting, competing, or mutually supporting practices across more-than-human relations through which tea cultivation is done, known, and transformed. This approach allows me to sketch how specific practices enact and merge seemingly opposed ontological positions (cf. Meurer this issue): the mechanistic manipulation of non-human life as economic resource on the one hand, and encounters with lively, sometimes unruly non-human life on the other. By attending to multiple ontological politics, I show that the appreciation of non-human relations underpinning organic agriculture can facilitate the plantations' coercive cultivation (Tsing 2012). Specifically, I demonstrate how both intersecting forms of agricultural ontological politics are articulated through labour issues at the heart of the plantation system: the profitable togetherness (Münster 2017, 32) of many species relies on exploitative labour. The workers' and supervisors' resistance against their precarious situation encourages a form of multispecies togetherness that differs from what the planters envision—including weedy monoculture fields, overgrown tea bushes, or ineffective soil care. I engage the »multispecies ontological turn« (Tsing 2018, 233) not just to make visible a world of many worlds (de la Cadena/Blaser 2018), but to analyse the interspecies power relations between them. This shows that ontological perspectives help us not only to imagine and do agriculture otherwise (cf. Laser/Sørensen this issue) but also to account for the persistence of (colonial, capitalist) power structures within new departures (cf. Schiefer this issue). Coercive plantation cultivation is not only so pervasive that it re-arranges ecologies around the globe to co-produce a new geological era (Haraway 2015), it is also fiercely persistent in the face of transformations, continuous resistance, and unruly growth.

My argument draws on ethnographic fieldwork I conducted at several tea plantations across India. In particular, I use data gathered at a small plantation in the flat valley of the large Brahmaputra river of the Assamese Dibrugarh district (65 hectares, 40 employees) and at a large plantation in the foothills of the Himalayas in the Darjeeling of West Bengal (640 hectares, 400 employees). In 2016 and 2017, I was present for the so-called *autumn flush*, the

last harvest period of the year. Over a total of six months, I participated in the daily work in the tea fields and factories and lived with the workers in the so-called labour lines, the accommodation provided by the plantation management. Through participant observation I not only become acquainted with the everyday lives of workers, supervisors, and planters (plantation owners) but also learned how the interactions between people, tea plants, and other non-human species influenced labour and production. Thereby, I used the methods of multispecies ethnography: working with those involved in devising organic practices, I observed plants, pests, and weather patterns and discussed these topics in structured and unstructured interviews. Further, I read agronomical literature to learn about soil microorganisms, fungi, and insects, paying special attention to the resources that organic planters use in their own practices. This allowed me to correlate plantation labour with plant growth and other ecological processes in my doctoral thesis.

In the following, I reflect on ontological politics through a series of ethnographic vignettes of tea plucking and organic fertilizer production, activities that underline the specificity of organic tea cultivation. Both plantations organise their labour largely according to industry conventions. For example, they practice strategic and coercive plucking of tea leaves and only tweak cultivation standards with certain organic practices, such as homemade fertilizers. Therefore, at first glance, these two plantations look exactly the same as their conventional neighbours—monotonous dark green surfaces that stretch as far as the eye can see. But closer inspection reveals a modest variety of other species that also participate in the cultivation. I show how the planters Swaroop (in Darjeeling) and Vinod (in Assam) attempt to integrate these seemingly opposing ontological politics—as well as how their employees negotiate the terms of production (introducing the supervisors Nayan and Palash, and the worker Deepa), and how various non-human species intervene. These encounters reveal the convergence of multiple ontological politics on unequal terms, in the course of which the plantations are re-arranged within the boundaries of their established, persistent organisation.

In the next section I introduce my theoretical framework and present my ethnographic material. Following this, I first discuss the intersection of coercive and organic ontological politics before turning to the various practices of resistance.

### The Multispecies Ontological Politics of Agriculture

Turning to ontologies makes for interesting anthropological accounts of agriculture because it sharpens our focus on the more-than-human dimensions of the ecological crises faced by cultivators all over the world. Here, engaging multiple ontologies not only means paying attention to different ways of doing agriculture (including their historical emergence and situated contingency); it also opens these discussions to a consideration of non-human life in which plants and animals are actors in their own right, with their own becomings and agendas.

Recently, a number of scholars have employed the ontological lens of Science and Technology Studies (STS) to examine the potentials and pitfalls of more-than-human entanglements in agriculture. On the one hand, they show how promising solutions may derive from acknowledging human/non-human interdependencies and carefully crafting relational ontologies. Maria Puig de la Bellacasa (2017, 170) envisions permaculture and organic soil care as transformative »alterontologies« that may foster alternative caring relations; and Daniel Münster (2018, 751) describes organic farming as an »ontological project of recu-

perating vitality, multispecies togetherness, symbiotic processes, and prosperity in a dying and degraded world of smallholder agriculture«. On the other hand, an ontological lens can also draw attention to exclusions and injustices. Contrary to Münster and Puig de la Bellacasa, Anna Krzywoszynska (2020, 244) finds that in the UK, soil-biota-oriented farming actually reifies »the ontology of land as a resource« and effectively expands »the enrollment of ecosystems into capital accumulation«. Such ontological criticism has also been directed at various other forms of industrial agriculture. For example, Sophie Chao (2018, 642) describes how the expansion of palm oil plantations in Indonesia »jeopardizes the well-being of the life forms populating a dynamic multispecies cosmology«, and Les Beldo (2017, 112) denounces the »flattened« ontology of living and nonliving beings that exploits the »metabolic labor« of broiler chickens in the United States.

In the context of these debates, ontological politics offers a conceptual tool for integrating both criticism and the quest for alternatives. According to Annemarie Mol (1999, 77), ontology describes how »reality is manipulated by means of various tools in the course of a diversity of practices«. Consequently, John Law (2004, 66) highlights that »different constellations of practice and their hinterlands might make it possible to enact realities in different ways«. This makes any performance that shapes the situations, constellations, and materialities of life a form of ontological politics. Thus, reality is always the result of a multiplicity of ontological politics clashing, merging, and transforming each other. Transferring this notion to agriculture, Daniel Münster (2018, 751) argues that »the politics of alternative agriculture performances lies in their production of alternative realities«. Like Münster, I take ontological politics to mean not only any practice by which people influence crops or livestock but also ways in which non-human life itself participates in the encounter. The strategic plucking of tea leaves is an ontological politics, but so is the tea plants' subsequent sprouting of new leaves. However, I am not only interested in alternative performances but also more conventional practices: more often than not, mainstream agricultures and their alternatives are closely interrelated, as shown by more extensive studies on organic food systems (Campbell 2009; Guthman 2014). Thus, I am asking how the alternative realities that organic cultivation techniques produce oppose, support, or change more established ways of doing agriculture.

Thus understood, I use ontological politics to engage with both the emergent field of more-than-human approaches as well as longstanding concerns with social justice. Focusing on the various ontological politics of non-humans broadens the possibilities of ethnographic description and allows us to bring together such seemingly disparate processes as plant growth and labour resistance. This approach allows us not only to respond to the urgent need to understand how the world is enacted by non-human life but also to carry forward discussions of social justice. Thus, I also offer ontological politics as a partial answer to concerns that multispecies perspectives do not pay enough attention to the historically formed social and political structures at the centre of various contemporary ecological crises (Bessire/Bond 2014; Graeber 2015; MacCall Howard 2018). By engaging with ontological politics at the intersections of environmental and social concerns, ethnography can make complex actor-networks available for critical analysis.

What characterises the ontological politics of plantation agriculture, organic practices, labour resistance, and non-human agency? Let us begin with the ontological politics of plantations, the most pervasive practices that shape my field sites. Prime examples of the commodification of non-human life through techno-scientific control and productionist paradigms (Haraway 2015; cf. Sapp Moore et al. 2019), plantations are often described as reductive, biomechanical ontologies that treat living beings as pliable machines and exclude

their vital life forces (Beldo 2017; Chao 2020). In her extensive work on plantations, Anna Tsing (2012, 148) bases her multi-faceted arguments on the observation that plantations practice »cultivation through coercion«—of both plants and people. Both historically and today, plantations are established through the displacement or even extermination of local people and plants, the preparation of newly empty land, and the import of precarious labour and cloned cash crops for mass-production (Tsing 2015). Plantations are »ecological simplifications« (Tsing et al. 2019, 186) in which living organisms are disciplined into resources by removing them from biodiverse life worlds and reinserting them into economically structured and rigidly managed environments: »Investors simplify ecologies to standardize their products and to maximize the speed and efficiency of replication« (Tsing 2017, 59). Plantations thus become »machines of replication« (Tsing 2016, 4), designed to produce massive quantities of assets whilst attempting to eliminate all life that does not contribute to profit. This management is a »project of rule« (Besky/Padwe 2016, 10) that seeks to make plant growth scalable. Such a project of coercive cultivation and ecological simplification also reflects the prevailing ontological politics on Indian tea plantations: exploited workers cultivate vast monocultures where there used to be large forests; tea bushes are cloned, plucked, trimmed, and sprayed so that they become more productive and predictable; the interactions between tea plants and other species are strictly limited; agro-chemical pesticides abound. Thus, a plantation could be seen as an attempt to enact a profitable *one world world* (Law 2015)—or a one lifeform world—by forcibly eliminating any other attempts at world making.

However, as Tsing (2012) notes, plantations also have *unruly edges*—the marginal but disruptive entities and processes which plantation dynamics create. Ultimately, plantations cause the proliferation of pathogens, because monocultures are breeding grounds for those insects, fungi, and microorganisms that eat the respective cash crop (Tsing 2017, 52). Unruly edges undermine the rationality of plantations, but they do not erase their detrimental effects, and often even spread them beyond plantation borders. Together with Andrew Mathews and Nils Bubandt, Tsing (2019; 189) suggests that the landscape structures of »modular simplifications«—enacted by multiple plantation-like practices and »feral proliferations«, including not just unruly edges but also alternative cosmologies, are key components of the Anthropocene. These analytical terms draw attention to the pervasive influence of industrial forms on all global ecosystems. But they also highlight that this influence is uneven, and that it rubs up against alternative world-shaping projects—often only minor interventions, but nevertheless important in the quest for potential solutions. So far, most of the literature inspired by Tsing’s argument has looked at how plantation-generated pathogens move beyond the boundaries of the plantation to disturb surrounding ecosystems (cf. Grandin 2009; Gan 2017; Perfecto et al. 2019). In contrast, this article examines the ontological politics of agriculture by focusing on minor interventions enacted on the micro-scale of the plantation itself, in the daily negotiations between workers, tea plants, planters, soil organisms, and many others.

Organic agriculture is often presented as an alternative to industrial farming. As mentioned above, some commentators have stated that organic practices can enact »friendly farming« (Tsai 2019, 343), against the odds. Daniel Münster (2018, 751) argues that Zero Budget Natural Farming offers smallholders in Kerala a wholly different ontological politics of farming: »sensing, inhabiting, and dwelling in new ways on the farm and cultivating modes of care that allow for symbiotically relating to soils, plants, insects, animals, and even microbes«. This improves not just the farmers’ livelihoods, but also the quality of their relationships to non-humans. By contrast, on the tea plantations I studied, organic agriculture

had quite different effects (cf. Besky 2013; Sen 2017). Even though agro-chemicals are not used, organic plantations are still intensely managed, large-scale monocultures. Tea plants are still plucked, tasted, cloned, manufactured, and sold according to parameters similar to those used by non-organic plantations. To be sure, organic practices require supervisors and workers to engage more closely with tea plants and other species; like smallholders in Kerala, plantation employees also need to assess the consistency of manures and the relations of their plants to other species. However, this new ontological politics becomes just another technique for asserting the plantation's control over ecological relations. In this context, the purpose of organic practices is to instrumentalise interactions between insects, fungi, microorganisms, or cows to increase the productivity of tea plants. The goal is to create a strategic togetherness that serves to maintain tea monocultures by enlisting the diverse polycultures at their margins. In increasingly difficult ecological conditions, organic agriculture ensures the long-term productivity of plantations. As plantation-induced ecological damage takes its toll, tea plantations must modify their production techniques in order to carry on. Organic plantations thus represent the convergence of techno-scientific practices and (a kind of) biodiversity, of colonial land management and agro-ecological practices, and of labour exploitation and aspirations of sustainability.

While these variations of coercive cultivation are noteworthy in themselves, the following ethnography also describes two further ontological politics which I found on organic tea plantations. The first is the sometimes-disruptive intervention of non-human life. Although plantation management has a pervasive influence on the shapes and rhythms of tea plant growth, the plants are always responsive to other processes and other bodies. Despite the constant effort put into creating orderly growth patterns, slight variations appear all the time. Tea plant growth rates depend on variations in sun and rain, and may be slowed by negligent plucking practices or insect pests. Most of the time, these variations do not have much of an effect in the overall scheme of things, but their consistent appearance indicates the presence of minor alternative ontological politics beyond the coercive trimming, harvesting, and manufacturing of tea. The second ontological politics is the resistance of plantation employees to the precarity of their labour and lives. This issue has been thoroughly discussed by Sarah Besky (2013), Piya Chatterjee (2001) and Debarati Sen (2017), whose ethnographies of Indian tea plantations elucidate the reproduction of colonial power structures through caste, class, and gender. Writing from a multispecies perspective, I extend this focus by zooming in on the daily negotiations of power between tea workers, planters, supervisors, and non-humans.

### Coercive Organic Cultivation

Manipulating the growth of tea plants (*Camellia sinensis*) is the central activity around which tea cultivation revolves. Tea plants are a species in the family *Theaceae*, whose native varieties are found in forest undergrowth across Southern Japan and Korea, the South of China, North East India, and much of mainland Southeast Asia. In these forests, tea plants grow into small, evergreen trees with thick, waxy leaves, yellow-white flowers, and strong taproots. In the first half of the 19th century, after the British annexation of Assam, colonial personnel began to cultivate *Camellia sinensis* var. *assamica*, called the *Assam jat*, on the Indian subcontinent (eventually, after decades of trial and error, they also succeeded in cultivating the Chinese variety, called the *China jat*). For this purpose, they adopted the plantation model, which was already well established in other colonised places, and which

Sidney Mintz (1986) describes as a predecessor of both industrial agriculture and the factory. This cultivation form changes the growth forms and rhythms of the tea plant to enable the mass production of tea leaves for the global industry that was once so crucial for the British Empire (Sharma 2011).

Today, the cloning of hyper-productive specimens is the basis of the plantation cultivation of tea plants. In a laboratory, cuttings from hybrid mother bushes are propagated so that all plants of a particular clone type are genetically identical. Although raising plants from seed provides the genetic diversity that makes them potentially more resistant to pest and changing climates, genetically identical clones enable an assembly line style of production: plants sprout at the same time, react similarly to their environment, and develop a consistent taste. This allows cultivation areas to be scaled and controlled more smoothly, and pluckers to work faster and therefore harvest more leaves. Commercially distributed clone series are adapted to the requirements of different climate zones, soil conditions, or market niches. The plantations on which I conducted my fieldwork cultivate clone monocultures in different varieties: the plantation in Assam grew only the Assam jat and its hybrids; the plantation in Darjeeling grew mostly the China jat and its hybrids, but also some Assam jat hybrids. Although one organic consultant of the Assamese plantation expressed the view that cloned plants were not natural and should be substituted for more diverse plantings, both planters adhered to the convention of cloning. When new plantings are due—for instance because older bushes have become less productive or have reacted negatively to the drastic climate changes of recent years—the planters choose from the constantly updated clone series on offer. Therefore, their plantations not only look the same as their conventionally cultivated neighbours, they are also genetically identical to them.

But even optimised clones require diligent care to grow productively. For example, strategic plucking is necessary to synchronise plant growth with industrial production. Not just a harvesting method, it also accelerates the sprouting of fresh leaves. Since colonial times, pluckers have been instructed to pick only »two leaves and a bud«, because fresh leaves and buds are the most photosynthetically active part of the plant and contain a higher concentration of the chemical constituents that make a good drink. The darker, longer, coarser leaves, which grow lower on the bush, are merely considered *maintenance foliage* and are not fit for the factory. Furthermore, frequently removing these young shoots triggers growth impulses in plants and makes them quickly re-sprout. If these sprouts were not removed, the plants would direct their energy towards producing flowers and seeds, neither of which are valuable for tea production. Regular plucking makes plants commence the budding stage again and again, so tea flowers are rare, only growing on the lower, unplucked branches of bushes. The presence of flowers on the tops or sides of bushes would indicate that they had not been plucked for weeks: a loss in harvest and in productive plant energy.

This plucking practice not only increases the harvest and standardises growth, it also synchronises the re-sprouting of fresh leaves with industrial schedules. The more frequently young shoots are plucked, the more shoots follow, and the leaf period shortens. But the plants cannot continuously direct carbohydrates towards growing new shoots, so if too many shoots are removed too frequently, the bushes' productivity could decrease. Plucking should be done in a moderate and controlled way, guided by experienced judgement of plant growth. Ideally, plucking should manipulate the phyllochron—the time it takes for young leaves to appear—to an interval of five to nine days. To achieve this, the planters want supervisors and workers to pluck the rows of bushes consecutively and regularly, and to revisit the same spots at intervals that are attuned to leaf periods as closely as possible.

On conventional tea plantations, the ecological simplification of plant growth achieved through cloning and plucking is complemented with further techniques: agro-chemical fertilizers regularly and evenly supply the bushes with customised and quantifiable nutrient doses. Similarly, the extensive application of pesticides eliminates most life that does not contribute to profit and interferes with orderly plant growth (Tsing 2015): workers routinely kill fungi and insects that feed on tea plants as well as other plants that compete for root space. This is a point at which the ontological politics of organic agriculture comes into play: instead of killing non-human species, organic planters want to strategically employ their »metabolic labor« (Beldo 2017, 108), their ecological relationships with the tea bushes, for the sake of tea production. To this end, they instruct supervisors and workers to integrate insects, mushrooms, weeds, and other entities into daily labour, thereby recruiting these non-human species as co-labourers.

One example for this ontological politics of collaboration is *kunapajala*, the Assamese planter Vinod's recipe for a combined fertilizer and pesticide. The mixture is fermented from cow dung and various plants—an edible fern called *belongini* (*Diplazium esculentum*), leaves of the *karange* tree (*Millettia pinnata*), *halodhi* roots (*Curcuma longa*), leaves of the laurel variety *dighloti* (*Litsea salicifolia*), and flowers from wild hops (*Flemingia strobilifera*). The cow dung fertilizes the soil, while the plants are supposed to hinder the reproduction of the tea mosquito bug (*Helopeltis theivora*)—whose numbers are steadily increasing due to recent climatic changes—deter a number of mites and spiders, and have fungicidal effects. Despite deterring and sometimes also killing certain non-human beings, *kunapajala* creates a kind of biodiverse community on the plantation, or rather a new ecological togetherness. Cows now stroll through the identical rows of tea, and various plants are either cultivated on the hitherto fallow fields outside of the plantation or even grow between the bushes. Other examples of collaborative ontological politics are the installation of bird houses (encouraging as many birds as possible to nest in the tea fields and eat tea-eating insects) or the planting of lemongrass between tea bushes (which fixes nitrogen in the soil). This way, tea fields become weak versions of »polyphonic assemblages« (Tsing 2015, 24), an amalgamation of complex ecological interactions and temporalities, though one that remains oriented towards production schedules.

Integrating organic practices and standard plantation cultivation techniques allows Vinod and Swaroop to intimately encounter non-human life as well as control it. I participated in extensive tasting sessions in their offices and homes, and our casual conversations usually revolved around the wonders of ecology. The planters gain a sense of pleasure from tasting, smelling, observing, or photographing tea plants. As I mentioned above, workers and supervisors are often similarly appreciative of the non-human life they encounter during their work shifts. They are often proud to produce organic tea and point out the many shortcomings of conventional cultivation. Many also make a point of only drinking organic tea at home. Again, this interspecies intimacy and fascination is closely related to the more coercive plantation practices because it also provides valuable business information. People translate their knowledge about ecological relationships into management strategies. Thus, improvisational, unscripted impressions complement the precise techniques, such as cloning or homogenizing, through which tea plant growth is usually assessed.

This section has shown that planters who want to cultivate tea organically retain the general structure of the agricultural »machine of replication« (Tsing 2016, 4): they seek to regulate and optimise the growth of tea plants through cloning and plucking. But they substitute other conventional techniques of ecological simplification—most notably the extensive use of agro-chemical pesticides and fertilizers—for strategically placed symbi-

otic relationships between various species. Thereby, coercive cultivation becomes an even more dominating force, integrating more than just monocrops into the plantation project. That is, organic cultivation techniques integrate the unruly edges of the plantations into the production process. They decrease some of the harmful effects of intensive cultivation, but increase the overall influence that plantations can have over non-human beings. Yet precisely because it is vitally dependent on the collaboration of various actors, this is also a highly contested strategy.

### Weak Resistance and Unruly Growth

Worker and supervisor resistance as well as the unruly interventions of non-human's influence both coercive and organic cultivation. For example, strategic plucking and soil care often fail because labour resistance makes tea plants growth unruly and changes the terms of organic collaboration across species. In the vignettes that follow, I focus on forms of everyday or weak resistance: the spontaneous, cautious, uncoordinated, and mostly anonymous everyday practices, such as noncompliance, slowdown, or unpunctuality, through which tea workers negotiate their situations (Scott 1985). In addition, I investigate how weak resistance affects (and is affected by) non-human agency.

The most obvious way workers and supervisors resist coercive cultivation is by not complying with plucking instructions. During my fieldwork, this took a number of forms: workers returned late from lunch breaks, showed up hungover after payday, or avoided plucking in the blazing sun; supervisors left the work group unsupervised or neglected the remote sections; child workers sang and played when unsupervised. As a result, several areas of the Assamese plantation were quite overgrown, particularly those furthest away from the factory. Even viewed from afar, the outline of the bushes looked irregular and the plucking table was very uneven. Upon closer inspection, ferns, grasses, and vetches grew higher than the tea in some places, and rows were no longer visible between bushes. Not surprisingly, the planter was frustrated with this improper state of the plantation, but tea pickers seemed to make the most out of the unmanaged situation, often foraging for edibles among the weeds on their way home. Particularly popular were fiddlehead ferns, called *dhekia*, which thrive amongst unkept tea bushes and often made it into the workers' *saag* dishes. Not only does the everyday resistance of workers change the normative, productive form of the tea bushes themselves, it also introduces a kind of multispecies togetherness other than those intended by organic practices.

An even more striking variation of normative tea plant forms was enacted during the 2017 general strike in Darjeeling, which lasted 104 days during the monsoon flush, the main harvest period. The agitation was led by the Gorkha Janmukti Morcha, an unrecognised subnationalist party striving to found a federal state, Gorkhaland, that would be independent from West Bengal. The Gorkhaland movement is linked to a long-standing dispute between the inhabitants of the district, the federal state of West Bengal, and the government of India. »Gorkhas remain pegged to the lowest levels of employment, while outsiders own the tea industry, meaning its profits flow out of the hills« (Bennike et al. 2017). Thus, the tea industry is the main scene of this conflict because the frustrations of tea workers are central to the widespread support enjoyed by the Gorkha Janmukti Morcha. One effect of the strike was a proliferation of plant forms: instead of a uniform *two leaves and a bud*, Darjeeling's tea plants grew into various shapes during the heavy rains—shapes that plucking would usually prevent. When I arrived on the Darjeeling plantation in November 2017,

months after the strike had ended, I noted that its tea fields still looked different from the previous year. Tea flowers were abundant, and I even saw a few tea plants that had presumably been overlooked by the workers and grown almost taller than me. They gave the impression that the plantation was turning into woodland, and the plants' stems had already become thick, almost trunk-like. I assumed that it would not be possible to revert them back to a bush shape. Supervisor Nayan agreed, speculating that if they were not chopped down, they would grow into tea trees—a common shape for wild tea plants, especially amongst the Assamica varieties, but rarely seen on plantations.

Employees resist organic practices in similar ways, with similar results. Consider, for example, the care for other species described above. Organic planters cultivate microorganisms mainly by feeding them cow manure. They thus seek to recruit cows to influence interactions between soil microorganisms and tea plants. But this collaboration often fails because the workers do not comply with the planters' directions. Prior to my fieldwork, planter Swaroop in Darjeeling had offered to buy dung from his workers if they invested in cows, so that the plantation could be self-sufficient in manure. But in 2016 and 2017 I could not find a single family who still kept cows. Worker Deepa explained that shortly after they had acquired their cow, the water supply of the labour lines broke down. For a couple of months, she had been forced to walk for half an hour every day to fetch water from a stream. Having neither time nor energy for the cow, the family sold it. Deepa said she wished that the management had repaired the water supply instead of introducing cows. She also said that she had liked the cows, just as she enjoyed keeping a pig, but she could eat the pig at some point, whereas she could only sell the cow's dung for a pittance. Deepa knows that cow dung is important for organic tea cultivation, but she was not in a position to provide it. When a disappointed Swaroop noted that his employees had become »too rich to care« for cows, he also implied that they had become »too rich to care« for the soil. Deepa's perspective was the opposite: on top of caring for tea plants, she could afford neither to keep cows nor to care for the soil. Because of the heavy workload they require, some of the beneficial relationships between cows, soil, and tea roots are too difficult to obtain.

The situation is slightly different on the Assamese plantation. The cows belong to the planter, and the workers have to care for them in their spare time, without additional pay. Women milk the cows in the mornings, and children gather their dung in the evening. Since the cows roam freely on the plantation, the men must sometimes herd them away from tea seedlings so that they do not trample them. These tasks are exhausting and exceed the diligence of workers. As a result, cow-based soil care often fails, lessening the influence the management can exert on soil microorganisms. This is exacerbated when employees avoid preparing and applying fertilizer. Even though planter Vinod required that workers spray *kunapajala* daily, supervisor Palash told me that they almost never do so. For Vinod, the mixture is a key element of his cultivation scheme, but because he rarely visits, he does not know that his staff by no means prioritise it. In addition to being overworked, they also find the fermented cow excrements repulsive. Like Swaroop, planter Vinod often complains about his employees' lack of sensitivity to the needs of tea plants and other non-human species, and he often laments that their lack of diligence jeopardises the health of his plants.<sup>1</sup>

These ethnographic stories reveal various resistance practices as separate but interrelated, and often mutually constitutive. Worker resistance sometimes spurs non-human resistance; non-human resistance sometimes limits worker resistance; and when both forms of resistance come together, they sometimes interrupt plantation production. These practices are not intentional interventions against domination, but they do emerge as a result of this domination. Workers and supervisors do not resist coercive or organic cultivation per se,

but rather the strain that both production forms demand from them. Unlike the planters with their organic ambitions, they are not interested in re-organizing tea cultivation but rather achieving a small degree of independence from it. Their everyday weak resistance enacts an ontological politics of evasion. Similarly, non-humans do not intentionally resist human instructions; they neither have a strategy, nor do they form an alliance. Rather, their occasional disturbance of plantation routines performs an ontological politics of interspecies collaboration, of polyphonic growth (Tsing 2015, 24), which coercive cultivation usually seeks to undermine. Both of these interrelated practices are therefore part of the unruly edges that authoritative ontologies create by seeking to dominate other forms of world making. Because they appear on the micro-scale of the plantation itself and do not affect other areas, I think of them as minor unruly edges. Minor resistance practices don't revolutionise tea cultivation, but they consistently limit and complicate it. This adds to the paradox of organic plantations: organic planters attempt to recruit the unruly edges into the plantation process itself—to render them *ruly*. But forms of unruliness continue to proliferate, both among the human and non-human denizens of the plantations.

### Unequal Alternatives that are not Actually Alternatives

These ethnographic stories show the various ontological politics that enact tea plantations in transition, how they meet on unequal terms, and how they »make some realities realer, others less so« (Law 2004, 67). Organic cultivation techniques tweak the principles of monocultures by inserting monocrops into lively networks of ecological interactions, which nevertheless remain closely monitored (at least in theory). Therefore, in some ways, organic cultivation practices even reinforce the pervasiveness of the plantation system. Coercive cultivation continues to dominate tea plantations, not just by dictating work schedules and plant growth patterns, but also by utilizing divergent ontologies, such as the relentless sprouting of weeds or the interactions of soil microorganisms and plant roots. Ultimately, my findings suggest that the multiple ontological politics of non-human lifeforms enact more of an alternative to plantation agriculture than organic cultivation techniques—especially if labour resistance provides temporary and minor opportunities for lively, unruly interactions between tea plants and other species. Multiple doings constitute and change the more-than-human relations of tea plantations—but some practices retain the upper hand, and minor contestations don't easily turn into major transformations. While the disruptive effects of agricultural intensification continue to take a toll outside of the plantation grounds, organic cultivation can stabilise the production to an extent. Organic plantations might be more adaptable than conventional plantations to the unpredictable ecological disturbances which plantations themselves have co-produced. But ultimately, the attempt of improved control through organic care is as contested as coercive cultivation.

The ontological turn is, among other things, a quest for alternatives, among them more liveable eco-social arrangements. This is an aspiration which anthropologists currently share with many other people. Since agriculture is at the forefront of these endeavours, agricultural practices are now under the close scrutiny of farmers, activists, and academics alike, who assess the numerous transformations of more-than-human relations under the banner of sustainability. Ontological perspectives contribute by making visible the alternatives that are already present amongst the multiplicity of practices that shape the world. In this article, I have demonstrated how a multispecies ontological turn (Tsing 2018) may support such examinations of agricultural practices and the environments they create, tak-

ing ethnography as a tool to map ontologically distinct positions across more-than-human relations. But my analysis of organic plantations has not added another hopeful account to the repertoire of »alterontologies« (Puig de la Bellacasa 2017, 170). On the contrary, it has foregrounded the persistence of conjoined economic and ecological precarity within alternative agricultural practices. The »conditions of possibility« of tea cultivation vary and might be changed—but it seems that the more plantation ontologies change, the more they stay the same. Here, the ontological perspective becomes a means of critique rather than an indicator of progressive transformation.

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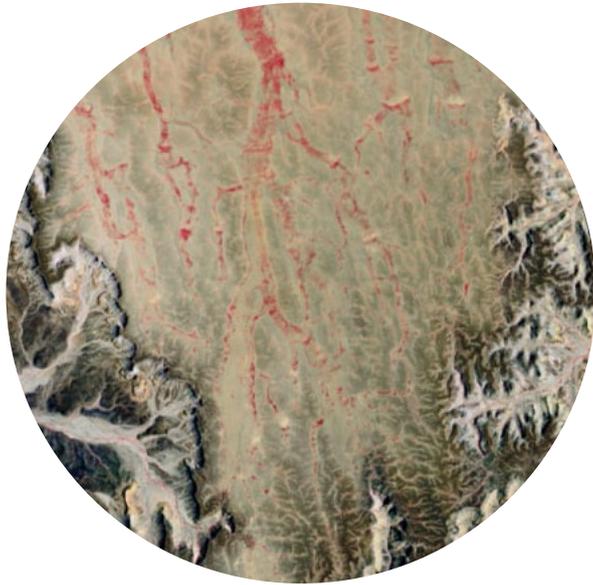
## Endnotes

- 1 Workers also undermine soil care in another, less direct way: litter and even larger rubbish dumps are found in remote parts of the plantations, swelling between the tea bushes. As I strolled through these places, I often found myself in the midst of discarded television sets, broken furniture, or unidentifiable heaps of scraps and shards. Nayan told me that some of these materials (plastic, aluminum, or other heavy metals) leach into the soil. Not surprisingly, this is frowned upon by organic certification companies. The planters place prohibition signs all over the plantation, reminding passers-by to »care for the soil« and refrain from dumping rubbish on it, but Nayan found that the amount of littering has not changed.

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# Negotiating Salmon. Ontologies and Resource Management in Southwest Alaska

Paula Schiefer

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**ABSTRACT:** *Current environmental crises disclose power hierarchies, such as within the negotiation of how to distribute natural resources. This paper focuses on the importance of acknowledging human-animal relationships and lived realities within the co-management and conservation of resources. The research draws on conflicting ontologies that can be found around salmon conservation in Southwest Alaska, especially around returning king salmon in the Kuskokwim River, which has seen a decline in numbers over the last decade. It illustrates the importance of considering the ontological constitutions of animals as beings, which renders the understanding of how human-animal relations can be maintained throughout crises. Rather than perpetuating the assumption that salmon are ›natural‹ objects, but understood and known differently by indigenous communities, the ontological approach enables us to recognize that salmon are not one entity but constituted beings in enacted worlds.*

**KEYWORDS:** *Resource Materialities, Political Ontology, Resource Management, Conservation, Salmon*

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## Introduction

Current environmental crises disclose power hierarchies, such as within the negotiation of how to distribute resources. Environmental issues also offer possibilities to identify differences in lived realities and the comprehension of beings and relationships within the world as such. As an environmental anthropologist, I am particularly interested in how people share their environment and social lives with other animals and how these relationships are maintained, changed, or negotiated within these environmental catastrophes. This paper focuses on the importance of acknowledging these relationships within the management of natural resources.

(Indigenous) Scholars and ethnographers have reflected on the role of animals and other non-humans in indigenous communities. They stress not only the dependent relations between humans and animals but also the importance of recognizing lived realities in the current (environmental and colonial) crises (e.g., Kohn 2007; Watts 2013; Todd 2014; 2016a; Belcourt 2015; de la Cadena/Blaser 2018). Practices and stories perpetuate concepts of animal agency and personhood and manifest the roles of animals in shared environments.

In recent years, academic discourse has often shifted the analysis of animals and other non-human beings under the concept of ontology. The anthropologist Sylvie Poirier (2013, 59) states that:

»unlike a symbolic approach, an ontological approach not only asks how a world is conceived (and how true and logical any conceptual system is), but also how it is lived and experienced, how different knowledge, valid within a conceptual system, gives way to different true experiences and other worlds.«

I understand the ontological approach as an opportunity for anthropologists to engage with the fields of conservation and natural resource management in our ethnographic research without replicating ideas about the ›natural‹ world. Instead, it offers us ways to reflect on different lived realities and environments and moves us away from concepts of a universal natural world (cf. Eitel/Meurer this issue).

My own research draws on conflicting ontologies that can be found around salmon conservation in Southwest Alaska. During my fieldwork, I concentrated especially on returning king salmon in the Kuskokwim River, which has seen a decline in numbers over the last decade, and which initiated a new set of conservation approaches. My field site, the Alaskan village of Bethel, is home to indigenous Yupiit<sup>1</sup>, who include animals as social actors within their lived experiences, especially in and through hunting and fishing practices. I advocate for the recognition of their individual life experiences and a granted status of expertise for subsistence fishing practices within conservation narratives. Furthermore, this article stresses the importance of considering the ontological constitutions of animals within different lived realities. This, I argue, defines how human-animal relations can be maintained throughout current and ongoing environmental and other crises. Instead of perpetuating the assumption that salmon are part of one objective universal nature, that is represented differently by indigenous communities, scientists, and other groups, the ontological approach enables us to recognize the variety of human-animal-relations, of ontological constitutions and realities.

Bethel is a home for many non-indigenous people, too, and the examples illustrated in this paper demonstrate that various ontologies co-exist for most of the time along the Kuskokwim River. However, these ontologies become incommensurable during certain moments of co-management, settings which promote the inclusion of indigenous and other voices in decisions about conservation strategies and attempts (cf. Blaser 2009; 2016; Meurer this issue). These moments of crisis, in which negotiations fail and new regulations negatively affect certain groups, reveal the multiple ways in which people include salmon in their lived realities.

The article is based on ethnographic fieldwork which was conducted between 2015 and 2017 (c.f. Schiefer 2019). I spent over 14 months in Bethel and participated in fishing practices, management meetings, and was able to follow the way in which the State of Alaska turns salmon into a countable and manageable resource. Bethel is the largest village of the Yukon-Kuskokwim Delta area in Southwest Alaska and has an estimated population of around 6,000 people. Most dwellers in the delta area identify as indigenous Yup'ik, however Bethel is also home to several white families who settled in the village during the last century. Bethel carries on attracting people of different ethnicities from other states of the US who often take relatively well-paid jobs within the school or health care system, or work for other State or Federal governmental institutions such as the Alaska Department of Fish

and Game. During my fieldwork I worked with many indigenous fishers, but also with several, predominantly white, fisheries managers.

Both indigenous fishing practices and governmental salmon management establish ways of knowing salmon, relationships of care, and perceptions of environmental changes, yet they seem to be conflicting in some areas. Following Mario Blaser (2009; 2016), I argue that conflicts in resource management and especially in co-management, settings in which local communities are prompted to engage in management decisions usually concerning natural resources, not only occur due to diverse perspectives on the world but also because some actors are unaware of different lived realities.

This article offers an empirical argumentation to demonstrate how ontologies are negotiated within co-management settings and to illustrate existing power hierarchies. It starts with the description of some of my experiences during the meetings of the Kuskokwim River Salmon Management Working Group (KRSMWG). It elaborates different constitutions of salmon that were enacted during the working group meetings that concerned the issue of returning jack salmon into the local fishery areas. From there, the paper moves on to explain how these constitutions are part of enacted worlds and draws attention to the negative effects of power hierarchies within conservation approaches. After managers articulated declining king salmon numbers in the Kuskokwim River, knowledge produced within the discipline of fisheries management was yet again ranked above local indigenous knowledge (Brown 2006; Butler 2006; McGoodwin 2006). While natural sciences are now searching for answers to react to changes in the environment and to protect and sustain salmon runs, the indigenous community in Bethel always included salmon and other beings in their legal orders and relationships. This article acknowledges that the comprehensive work of indigenous scholars (c.f. Napoleon 2007; Todd 2014; 2016a; 2016b) and indigenous communities ever since offered us insights to engage with environmental issues but are still discriminated against in current political and academic settings.

### Negotiating Returning Salmon

The importance of salmon and salmon fishing for Yup'ik communities in Southwest Alaska is immense; they rely on them for food and to maintain social, cultural, and spiritual relationships. With decreasing king salmon numbers after 2010, new circumstances were created through and around this environmental crisis, such as the regulation of subsistence fishing practices through State and Federal managers. These regulations, such as limiting opportunities for and the number of harvests, and the use of certain tools, disrupted fishing activities and the distribution of fish throughout kinship groups, forming a moment of crisis in the village of Bethel and other affected communities. While restrictions and regulations concerning commercial salmon fishing took place for several decades, it was the first time that the fishing routines of (indigenous) subsistence fishers on the Kuskokwim River became regulated. The State of Alaska defines subsistence use as the harvest of wild resources for non-commercial, customary, and traditional reasons, and can include purposes such as food, shelter, clothing, or tools. Different to most other countries, subsistence use in Alaska is linked to rural residency and not to a status of indigeneity.<sup>2</sup> Most people in Bethel can therefore harvest subsistence resources, such as birds, moose, and fish.<sup>3</sup>

Today, local conversations about salmon fishing often involve critique and complaints about current Alaskan State management strategies. While governmental institutions used to promote co-management, the last years of restrictions created tension that became too

strong to be negotiated with a satisfactory solution. These current negotiations about conservation strategies are informed by various knowledge about maintaining relations between humans and salmon. Before analyzing these relationships, I give an example of a co-management approach and some ontological conflicts that could not be overcome. In addition, it illustrates how ontologies of salmon can hinder communication and can lead to the disregard of Yup'ik relations to fish by governmental institutions. The example takes place at the Kuskokwim River Salmon Management Working Group (KRSMWG), a co-management group based in Bethel with the purpose of including different local actors in the processes of local salmon conservation. It uses the example of so-called jack salmon, whose behavior is a constant point of discussion in the co-management group and reflects the different notions of return and migration along the Kuskokwim River.

The Alaska Board of Fisheries formed the KRSMWG in 1988 to respond »to requests from stakeholders in the Kuskokwim Area who sought a more active role in the management of salmon fishery resources« (Alaska Department of Fish and Game 2017b). I attended the weekly meetings of the group during the salmon run times in 2015, 2016, and 2017. It was during these meetings that distinct ideas and misunderstandings, but also common ground, became evident to me and my research. Attending these meetings offered me an idea of how the migration of salmon was vitally embedded in the different conceptions of this animal. The annual return of salmon became a core part of the human-salmon relationship experienced in the Southwest of Alaska. The members of KRSMWG represent State and Federal managers and biologists, Yup'ik Elders, and subsistence and sport fishers from the Kuskokwim River. The main part of the meeting was the sharing of observations on the status of salmon migration. Wildlife managers usually presented monitored fish numbers and elaborated upon planned management strategies. Local subsistence fishers participated by reporting current catch numbers and offering comments or proposed changes to the presented management strategies.

Already during its initial implementation in 1988 the KRSMWG became of interest to anthropologists, as it provided a forum for exchange of diverse knowledge of fish resources and the attempt to establish a co-management system in the area. Daniel Albrecht (1990) conducted fieldwork in the first two years after the initiation of the group and concluded that the methods for acquiring knowledge used by the parties are a key factor for (successful) decision-making. Ideally, all parties would complement and inform each other and co-create knowledge about salmon. Biologists and managers rely on scientific data, while fishers acquire their knowledge in the practice of a subsistence lifestyle (*ibid.*, 91). The exchange of both knowledge and values would then enable a set of effective strategies that serve all interests. Just like in many other appraisals of co-management initiatives, the first years of KRSMWG were optimistic and promising ones.

However, Albrecht worked with the group during a time in which salmon numbers were seen as more abundant and subsistence fishers were not restricted in their fishing rights. Unfortunately, co-management is not the panacea that can dissolve long developed inequalities and colonial structures in having access to land and resources, and the environmental crisis of less returning salmon disclosed power hierarchies within the group. The KRSMWG is an example of how fisheries management try to integrate local perspectives into the approaches of Euro-American settler resource management to make them more accepted in the community. Yet, often referring only to one specific species, these attempts run the risk of failing to understand how people relate to animals and the land in general. The attempt to establish a co-management approach in Bethel did not only reveal differences in the constitution of salmon in local lived realities, but also highlighted fundamental

problems perpetuated through colonial power relations. Structural inequalities manifest themselves for example in the way job positions for biologists and wildlife managers are filled. Most managers are not indigenous nor raised in the area and are not always familiar with subsistence hunting or fishing practices. It should be emphasized that Euro-American settler science, locally perpetuated through biologists and other managers, and the knowledge of local fishers do not necessarily exclude each other. However, my research was mainly interested in the ontological limits of what is negotiable, and which indicate how the understanding of salmon are differently enacted. The following example of jack kings is, therefore, used to illustrate how various lived realities cannot be negotiated, but instead manifest power and knowledge hierarchies within settler colonial conservation approaches.

King salmon that are smaller than 20 inches, and considerably smaller than their companions, are usually classified as jack king salmon. Biologists state that these jacks are typically one or two years earlier in the migration cycle than the other king salmon that return to their natal streams. Sometimes they can even mature in fresh water or spend only a few months in the ocean before returning to the freshwater rivers. As salmon put on most of their weight during their time in the ocean, jacks lack the nutritional basis and time to gain the size that other salmon can reach. Scientists so far have not found a satisfactory explanation for this behavior (NOAA Fisheries 2016). Due to the size, fishers on the Kuskokwim River can identify a jack king salmon quite easily. These salmon are not targeted and are even avoided during fishing trips. This avoidance behavior can partly be explained as the smaller body would mean less eatable meat for the same amount of work. Often net mesh sizes are too large to catch these smaller salmon and if caught with a fishing-rod they can be released alive. Interestingly, there is a common local perception that assigns jack kings a special behavior and role they must fulfil. Indigenous fishers state that these smaller fish will not, like other salmon, migrate upriver once in their lifetime, but return to the ocean (and then grow into full-sized salmon) after scouting the Kuskokwim River. Back in the ocean, they would inform other fish if the migration back to their spawning grounds is desirable and safe.

I do not argue that the stories around jack fish can be somehow ›translated‹ into ecological knowledge that biologists could use for their management strategies. Instead, this knowledge shows how different people perceive and relate to animals and their actions. Jack salmon are an example of animals that evaluate their surrounding and human behavior, a basis for the Yup'ik ascription of agency and personhood to animals. Similarities can be found in other Northern indigenous communities, such as Colin Scott's description of Cree hunters and their appraisal of geese communication in a hunting situation. After a missed shot on a goose, the animal flew back in the direction it came from: »no more geese flew our way from the lake that day. Geese, apparently, could communicate to other geese about phenomena that the latter have not experienced directly« (Scott 1996, 80). Scouting animals in the context of Cree hunters and Yup'ik fishers indicate that the relationship between animals and humans is a reciprocal one. Based on information scouted by jacks salmon can decide if it is safe to return into the Kuskokwim River, hence responding to human actions. Fish are ascribed to be able to evaluate a situation and base action upon it, a common awareness of animals through which people can cultivate relationships with them. As Scott states, »knowledge traditions reflect the morality of the social practices and paradigms in which knowledge is framed« (ibid., 85).

At the KRSMWG, jack salmon were often part of debates. Biologists and some fishers strongly opposed the idea of jacks being scouts. While it was often simply judged as misinformation, I understand the debate as a misunderstanding of relations towards salmon and the lived realities from which these ideas arise. The knowledge of biologists and subsist-

ence fishers about jack salmon is empirical, both groups identify them through their smaller bodies. In addition, the Yup'ik sense of jacks as scouts reflects the reciprocal connections between human and animal behavior. This information about jack salmon cannot be incorporated easily into existing scientific categories, even though they refer to the same fish (cf. Nadasdy (2003, 123ff.), who describes the problems that arise with the compartmentalization and distillation of traditional knowledge to integrate it into management processes).

However, while there was always a disagreement about the role of jack salmon, problems with the categorization of jacks did not arise until managers put regulations on the king salmon fisheries. Until then, biologists could dismiss the Yup'ik understanding of salmon as local folklore, but now jack salmon started to affect their data collections on current fishing activities and the overall observation of salmon migration. As part of my research, I helped conduct in-season and post-season salmon subsistence harvest surveys for the local Native Council. During these surveys in 2016, I noticed that some subsistence fishers treated jack salmon as a separate species. Asked how many king salmon they caught, they normally left out the king jacks and only mentioned them after an explicit query. Jacks were considered as something that was dissimilar to the other five salmon species found in the Kuskokwim River. A fish biologist who worked for the Native Council in Bethel complained about this issue. For salmon managers especially, the idea that jacks would return to the ocean after scouting the river creates problems within their data sets. Within the surveys, it generates an incorrect estimation of how many king salmon were caught on the way up towards their spawning grounds, as people do not report them in the same category as other kings. The concept of an adult salmon swimming back to the ocean does not fit in with the assigned direction that the fish is supposed to travel to migrate towards their natal stream. Prospective calculations of king salmon reaching their spawning grounds are flawed by both the idea that fish would return to the ocean and by people reporting them using incorrect classifications (as a different salmon species), or, worse, not at all.

In addition, different perceptions of jack kings complicate fishing restrictions that work through the regulations of net mesh sizes. During a co-management meeting in April 2016, fishing with smaller mesh sizes was discussed as an option to provide people with the opportunity to fish without targeting the larger king salmon (larger fish usually do not get stuck within a mesh too small for their bodies, but rather bounce off and then swim around the fishing net). A Yup'ik Elder commented: »people in the villages think if they fish with 4-inch nets, they catch those smaller fish, jacks, which should be returning to the ocean«. In response, a female Yup'ik member replied that »this is a delicate topic. The belief in jacks is traditional knowledge, passed down for generations. Especially non-natives should not argue with Elders about jacks« (Fieldnotes, 20.04.2016). Rather than being able to reach an agreement on the use of appropriate fishing tools to protect king salmon while still enabling fishing for other species, indigenous fishers understood the use of a smaller net size as being harmful to the salmon run.

As this example has shown, jacks, which are representative of a wider comprehension of salmon as beings, create conflicts within the KRSMWG, even though all parties try to establish a system of co-management. Yupiit assign this fish an interactive form of behavior which conflicts with knowledge of fisheries managers that salmon migrate in only one direction. Technically, this did not matter until it collided with regulations and restrictions during a moment of crisis, and it explains why jack salmon have been recently negotiated in co-management approaches.

## Recognizing Human-Salmon Relationships

In the initial stages of this research, I interpreted the migration of Pacific salmon as a basic fact, something that salmon simply do. Often the migration is illustrated by beautiful stories about the long journeys these fish undertake to return to their birth grounds. Central to these stories is the life cycle of the anadromous salmon, which migrate between the Pacific Ocean and Alaska's rivers. In these stories, the idea that salmon migrate back home after several years in the ocean became an all-embracing one. My own fieldwork was coordinated around the events of fish migration (When do we catch the first king salmon? When can we expect the first silver salmon?). Activities were synchronized around the migration time of animals, mine as well as those of local fishers, fisheries biologists, and salmon managers.

Salmon passing through the Kuskokwim River and by the village of Bethel was a simple circumstance until I re-focused my attention on the process of migration and the way people spoke about it, both in the KRSMWG and elsewhere. With examples like the jack salmon, I started to concentrate on perceptions of salmon migration and connected ideas of where salmon return to. These ideas, I argue, are influenced by the relationships people and salmon create with each other and, as such, the ontological constitution of a salmon. In addition, they offer us an insight into the current colonial power structures in which salmon fishing in Alaska is embedded, and the impact ontological understandings and power hierarchies have in current environmental crises. Fisheries managers predominantly perpetuate a narrative of salmon migration that mainly concentrates on abundance, the quantity of salmon that return to the Kuskokwim River after having spent their adult years in the Pacific Ocean. However, other perceptions of salmon in the Kuskokwim River are strongly connected to the practice of annual fishing and the Yup'ik sense of animal agency. I argue that the way people care for salmon requires special attention in current conservation efforts. The articulation of human-animal relations by both indigenous fishers and fishery management staff refer to ideas of returning salmon to the Kuskokwim River; however, these concepts can contradict each other.

### Fishing for Return

Salmon fishing and the subsequent processing of the fish creates a discourse and a set of values about correct fishing within Yup'ik communities, which is constantly negotiated and renewed. Local oral history and daily practices amplify the importance of respecting salmon to become or stay successful in catching fish. They include the idea of not taking more than needed, processing the fish without any waste, and sharing the catch with others. Like in other hunter-prey relations in North America, anthropologist Ann Fienup-Riordan describes these practices as relations of reciprocity between Yup'ik and salmon in which the fish gives itself to the fisher in return for respectful treatment (Fienup-Riordan 1990, 72; 2015).

The main aim is to bring fish into the net and fishing for salmon ensures fishing success for the following years; the net, and the act of catching, establishes and continues the relationship between fish and human. These actions create and perpetuate relationships between human and salmon in a special way. Humans and non-humans are obligated to behave in a certain manner, not only for the ongoing fishing season, but as a general way of living. This is due to the sense of agency and the relationships Yup'ik assign to humans and animals, who are only distinguished through actions. Fish, as other animals, are sentient beings with awareness, and can respond to others within these relationships. These rela-

tionships are not only expressed in fishing practices, but also manifested in other areas, for example in oral history and material culture, such as mask making (Mossolova et al. 2019).

Assigned personhood includes the idea that animals can control their actions and fate. Fish choose a fisher's net, based on their former behavior, and fishers are supposed to (only) take what fish present themselves (Fienup-Riordan 1999, 15). If a fish is treated well after being caught, then it will come back to the same net or same fisher the next year, a reciprocal relationship that generates continued abundance. This conscious decision implies that animals can decide not to return if the fisher did not previously perform in an appropriate way, for example if they did not share their catch with a vulnerable community member or if fish went to waste. A decrease of the salmon run can, thus, strongly relate to the former behavior of an individual fisher or of the community.

The awareness of animals as persons is still present in Yup'ik communities. It frequently refers to ideas of *Yuuyaraq*, the Yup'ik way of life as a human being, a concept that highlights the importance of relations and interactions with others, human and non-human. *Yuuyaraq* mainly featured in storytelling and is part of Yup'ik oral history, but today several Yup'ik scholars base their writing on the concept. Examples are Harold Napoleon's *Yuuyaraq: The Way of the Human Being* (1996) and Oscar Kawagley's *A Yupiaq Worldview: A Pathway to Ecology and Spirit* (2006). Both authors see *Yuuyaraq* as an active part of living a Yup'ik life and to process the collective trauma that the communities experience(d) through colonialism. These Yup'ik scholars stress the importance of maintaining and strengthening current relationships between Yupiit, animals, and the environment to address former and ongoing struggles and to decolonize their land. *Yuuyaraq* is now understood as a way of healing in a time where high rates of alcoholism, drug abuse, and suicide are affecting many families in the communities.

The role of hunting and fishing to maintain human-animal relations is therefore very different to current management strategies, in which conservation efforts are normally based on the restriction of harvest numbers. Whereas managers calculate salmon run numbers to evaluate the abundance or decline of salmon, Yup'ik subsistence fishers express their concern about returning salmon mainly in direct references to fishing and fishing success, often from a historical perspective based on their own experiences. Comparisons with former fishing success during king salmon season were common. Fishers told me that in the past one had to be cautious and bring in the fishing net quickly, as the weight of the numerous and large king salmon would otherwise risk capsizing the boat. The decrease in fishing success is not only connected to the idea of a decreasing number of salmon in the Kuskokwim River, but people further observe and describe a reduction in the weight and size of king salmon. Families had to readjust their catch numbers upwards to even out smaller fish.

For Yupiit, fishing for salmon does not hinder salmon from swimming upstream to their spawning grounds, but the net offers an alternative destination for the fish to choose. Yupiit fishers understand the act of catching salmon less as a disturbance of their migration behavior, but rather as a way to sustain and perpetuate relationships with the salmon in the future.

### Salmon Homes and Resource Materialities

Fisheries management along the Kuskokwim River typically share a clear narrative of where salmon belong: their spawning grounds. To ensure that a set number of salmon reach these places, fishing regulations are enforced, and salmon are counted in several stages of their journey upstream. Spawning grounds are the places salmon were born, and the process of returning to the birthplace for reproduction is also known as *homing*. It is not only

through this term that salmon migration and their life story can be easily related to human concepts of home, including a clear geographical location. Biology and salmon management created a strong narrative around salmon migration that determined their spawning grounds as a fixed location they must reach, usually connected to notions of reproduction. In this story the animal puts all its energy towards migrating to its birthplace to reproduce. On the long journey home, obstacles such as fishing nets or predators must be overcome. Scientists in Alaska have several mechanisms to count the fish in the river and describe migration behavior. During my fieldwork, I worked with fisheries managers to understand how these methods and narratives around salmon migration shape each other. Through fish weirs, tags, aerial surveys, and household interviews, managers cannot only define the direction in which salmon swim but are, furthermore, able to estimate how many of them will arrive at their spawning grounds.

The concept of salmon homes for fisheries managers symbolizes not only the birthplace of salmon, but also establishes a trajectory destination for the animal's migration (cf. Swanson et al. 2018, 18; Schiefer 2019). During this migration, humans might engage with the animal, potentially stopping it from reaching its natal stream. This could include fishing activities, but also human-made constructions like dams and weirs. Salmon homes are a construction of fisheries science and determine how salmon are recognized as a natural resource. The salmon home is connected to the reproductive control of salmon in the Kuskokwim River, and agricultural metaphors often dominate conservation strategies (cf. Lien 2012, Smith 2012). In addition, salmon homes are not only connected to resource management but also to ownership. Gro Ween and Heather Swanson (2018) trace the historical awareness of salmon migration and its connection to an idea of home within the founding and strengthening of nation states. The authors examine how the biological concept of homing establishes a relation of ownership, in which salmon become a resource that can be assigned to a nation. Because salmon move between bodies of water and can spend most of their life in international waters, they need an assigned home, a fixed location within a nation state to be owned by a state (ibid., 196f.). However, before nations could claim ownership over salmon, scientists had to develop methods through which they were able to get to know salmon migration behavior. This knowledge led to a gradual understanding of rivers and spawning grounds as a home. It was not until the twentieth century that fisheries scientists developed experiments that were able to define the process of homing. Even today the effects of smell or magnetic fields are not fully understood and still subjects of research, and new results could alter the idea of salmon homes (ibid., 199ff.).

Hence, fisheries science made new knowledge available that turned salmon into an additional natural resource for states. Today, the State of Alaska claims a monopolizing role in determining illegal and legal forms of human-salmon interactions and elaborates on questions of access and ownership that arise in current conservation strategies and between the Alaskan State and indigenous communities. With reference to Richardson and Weszkalnys (2014), Ween and Swanson (2018, 206) state that »the scientific practices [...] have had major implications for conceptions of salmon belonging and ownership and for the development of a new ontology of salmon resource«. I therefore understand the migration of salmon towards home as outcome and not as starting point of fisheries management and see this understanding of salmon homes as part of an ontology that shapes current Euro-American resource management in regards to salmon.

Richardson and Weszkalnys (2014, 5f.) write that in addition to studying the possible engagement with natural resources, for example conservation or extraction, resources should

not only be studied as a commodity but furthermore as something that comes into being. They furthermore state that:

»the methodological framework we propose here starts from the assumption that we are dealing with relational phenomena of what we call ›resource materialities‹. This involves the combined examination of the matters, knowledges, infrastructures, and experiences that come together in the appreciation, extraction, processing, and consumption of natural resources.« (ibid., 8)

Understanding how natural resources become what they are is a crucial part in recognizing ontological differences in conservation efforts. The scientific framing of salmon, including the idea of a salmon home, turns them into a resource that needs protection during its migration and is now dominant within conservation negotiations. Ween and Swanson (2018, 209) stress that »as home-based ways of doing salmon have become politically dominant, they have pushed aside other modes of relating to these fish«. The Yup'ik perception of salmon, a being that engages in reciprocal relationships with humans and confirms the ongoing relationship by being caught, is not compatible with the dominant one that focuses on home and reproduction. Rather than a concept of home, the return of salmon to Yup'ik communities is a confirmation of ongoing human-salmon relations, and fishers trust in the salmon to provide them with food each year.

### Ontologies and Conservation

These fundamentally distinct ontologies, the understanding of salmon and their agencies, exclude each other and cannot be negotiated in co-management settings, as the example of jack salmon showed above. Mario Blaser (2009) framed these ontological conflicts over resources under the concept of *political ontology* (cf. Jensen this issue). He defines them as »the notion that there exist multiple ontologies-worlds and the idea that these ontologies-worlds are not pre-given entities but rather the product of historically situated practices, including their mutual inter-actions« (ibid., 11). Blaser studied political ontologies in settings that attempt to integrate so-called *Traditional Ecological Knowledge* into resource management approaches. He argues that the arising conflicts in these settings »happen not because there are distinct perspectives on the world but rather because the interlocutors are unaware that different worlds are being enacted (and assumed) by each of them« (ibid., 11). In one of his examples, indigenous Yshiro and managers working for the Paraguayan government try to establish a ›sustainable‹ hunting program but fail due to the dissimilar constitution of the worlds and the (reciprocal) human-animal relations within the enacted environments. Blaser's concept of political ontology acknowledges the ontological presumptions made by several parties within the management of resources. This concept is helpful as it applies current discourses of ontologies and can be used as a tool to understand how current (colonial) power hierarchies are still maintained and perpetuated. Environmental crises and conflicts over resources create frictions (Tsing 2004) that can move our analysis of ontologies onto a level in which we can support the aims of decolonization and work towards a dismantling of the capitalist system responsible for ongoing environmental destruction. While the salmon stock in the Kuskokwim River is only a small part of the picture, it illustrates the importance of recognizing ontologies and power distributions within resource management. Although the communities along the Kuskokwim River established a co-management group to discuss salmon conservation, examples like jack salmon illustrate the clear hierarchies within

that approach. It is therefore important to point out that biologists do not have a ›neutral‹ or ›objective‹ position on salmon, as their approach to manage salmon is rooted in scientific, political, and historical processes.

The different constitutions of Kuskokwim River salmon became apparent within newly emerging conservation approaches. The dominant position of fisheries managers and their ontologies in Bethel, however, became apparent too. Their conservation strategies based on concepts of reproduction and home suppress local indigenous relationships to animals and the land. Power hierarchies within conservation correlate with other colonial forms of domination. Exploring the conservation of bison in the US, Paul Berne Burow (2017) illustrates how:

»the model of conservation derived from settler colonialism is predicated on the threat of extermination made possible by the disruption of relationships among beings. In other words, it is the translation of land (rich with dynamic and interlocking relationships) into habitat (situated for the survival of a single or hierarchical set of species). In this sense, conservation is not just about sustaining a place, and its ways and species, or even a species itself, but about conserving the endurance of the settler colonial project, a way of life that individuates by separation, eliminates through replacement, and sustains through domination.«

The consideration of different ontologies that constitute salmon offers, therefore, not only an explanation for failed debates within co-management settings, but furthermore an analysis of the current political relations between the State of Alaska and the indigenous communities.

## Conclusion

This article reviewed the different ontological constitutions of salmon, enacted within my fieldwork setting in Bethel, Alaska, and the Kuskokwim River. Ideas of salmon migration are crucial to understand how ontologies are negotiated within current conservation practices. With a decline in king salmon numbers since 2010, fishing restrictions became stricter and sparked an even greater reluctance to cooperate with Federal and State wildlife managers. The case of jack salmon exemplifies how negotiations about access to resources are determined by existing power hierarchies when conflicting ontologies cannot be integrated or categorized within current management strategies. Next to ontological differences, I understand the discussion about jack salmon within co-management settings like the Kuskokwim River Salmon Management Working Group as a form of resistance within the processes of decolonization, a constant reminder that the perception of animals does not comply with the »compartmentalization and distillation« (Nadasdy 2003, 123ff.) of indigenous ontologies.

Above all, these current conflicts should be contextualized in the ongoing efforts of the self-determination and decolonization processes that the indigenous communities face. The devastating impacts Western colonialism has within the area of Southwest Alaska cannot be stressed enough. The work of Yup'ik fishers, criticizing management regulations in public, contributing within co-management attempts, or performing acts of resistance (such as ›illegal‹ fishing), needs therefore also to be understood as an act of decolonization. Likewise, the maintenance and cultivation of ontologically established human-salmon rela-

tions through subsistence fishing is an important part of self-determination and indigenous identity.<sup>4</sup> Current debates about the environmental crises would do well to shift the focus towards different narratives, which can offer new understandings of our shared environments and how we live in them. Relations create realities, and we should be open to question what exists and how it is enacted in stories and practices. ›Sustainability‹ in an environmental context is highly dependent on the relationships that are involved, and which either should be sustained or should be overcome.

## Endnotes

- 1 Yup'ik (singular) and Yupit (plural) are based on the Yup'ik word *yuk*, person, and the post-base *-pik*, real or genuine, and can be translated as *real person* or *real people*.
- 2 In other countries, generic indigenous rights often include rights to land, subsistence activities, and the use of subsistence resources, and are held by all indigenous people. An example is Canada where subsistence rights are understood as being inherent and not dependent on recognition through settler colonial legislation.
- 3 The Alaskan Department of Fish and Game (ADF&G) estimates that one-third of all households along the Kuskokwim River fish for subsistence reasons, and that many more people are involved in the processing of the catch (ADF&G 2017a). For people familiar with the area this number seems surprisingly low. However, it can be explained by two main factors. Firstly, the Kuskokwim hub village Bethel has a large number of households that are not involved in fishing practices at all, such as white non-locals who moved from other US states. In addition, ADF&G defines fishing households as those that catch fish. Even if extended family members help with processing salmon and consume it as a staple food, they are defined as ›non-fishing‹ households if they were not involved in the harvest of salmon.
- 4 A deeper, well-grounded analysis for the role of fish within colonialism and processes of indigenous resistance practices can be found in the work of indigenous scholar Zoe Todd (2014; 2016a).

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# Rethinking Political Ontology. Notes on a Practice-Related Approach and a Brazilian Conservation Area

Michaela Meurer

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**ABSTRACT:** *For a critical discussion of power asymmetries within the co-managed protection of natural resources, political ontology offers a valuable theoretical framework. Relevant studies demonstrate that sustainability cannot be determined ›objectively‹ but is deeply entangled with, and dependent on, the specific ontological constitutions of worlds. However, my case study within the Brazilian conservation area Resex Tapajós-Arapiuns also reveals the limitations of a political ontological approach, as the framework cannot completely contend with the fragmentation of social collectives and the ontological plurality of everyday enactments. Demonstrating that this blind spot is the effect of a specific analytical perspective, I argue for a practice-related reformulation. Illustrated with the empirical data of my case study, I propose the adoption of three concepts for a practice-related political ontology, namely plural ecologies, ontological consequences, and contextual assumptions.*

**KEYWORDS:** *Political Ontology, Plural Ecologies, Brazil, Co-Management of Natural Resources, Extractive Reserves (Resex)*

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The pioneering studies on ontology in anthropology focus on the metaphysical constitutions of multiple worlds. They analyze indigenous ontologies and thus illustrate the specificity of the Western world (e.g., Stolze Lima 1996; Viveiros de Castro 1996) or categorize different ontological orderings (e.g., Descola 2005). With the approach of political ontology (PO), questions of power have entered the debate. Less concerned with the investigation of specific ontological constellations of worlds, PO examines the power relations that arise *between* worlds, and traces emerging dynamics of conflict and appropriation (Blaser 2009a). By adopting this perspective, PO enables a critique of social and ontological power relations and enriches the ontological turn in anthropology (cf. Eitel/Meurer this issue).

Scholars commonly use the PO approach for case studies in the context of participatory environmental governance, namely government conservation projects with shared governance involving local populations in decision-making and management. They study, for instance, the joint elaboration of norms for sustainable hunting (Blaser 2009b), or the co-management of guanaco population (Petitpas/Bonacic 2019) and salmon fishing (Schiefer this issue). These case studies critically point to the fact that—among many other difficulties evident in participatory environmental protection—ontological hierarchies persistently

lead to a weakening of local populations and to an enforcement of external, government positions.

Due to this specific perspective, which integrates sensitivity to ontological diversity *and* to power imbalances within projects of shared governance, the PO enriches my scientific examination of the regulations for resource use within the Resex Tapajós-Arapiuns (Resex TA). The Resex TA is a conservation area for sustainable resource use, situated in the Brazilian Amazon Region. It is co-managed by delegates from the local population, governmental agencies, civil society organizations and scientists, gathered together in an administrative board. Although Brazilian legislation implemented guidelines for the effective integration of local voices into decision-making, the negotiations within this administrative board are influenced by particular hierarchies and asymmetries of power. In 2013, the administrative board approved a utilization agreement with binding regulations for resource use—a moment where ontological multiplicity became visible, as I will demonstrate. I understand the term ontological as referring to the metaphysical principles of being, that are constantly reenacted and thereby possibly stabilized or de-stabilized in practice (cf. Blaser 2013a, 21–24).

Still, the application of PO to my case study confronts me with a challenge. Until now, PO's interest has lain in the power structures between the worlds of different collectives, mostly between ontologies of local (often indigenous) groups on the one hand and national agencies, scientists or NGOs on the other (e.g., Bonifacio 2013; Gombay 2014; Glauser 2018; Petitpas/Bonacic 2019). Thus, ontological difference coincides with socio-cultural and/or ethnic difference. The Resex TA, however, presents a setting where social groups and stakeholder groups are fragmented, identities and social belonging are fluid, and furthermore, single individuals commonly participate in distinct ontological constellations. Concordantly, ontological multiplicity and relations of power in this empirical case cannot be reduced to the opposition between local populations and nation-states, or local versus external actors. More complexity and heterogeneity seem to be at stake. The following argumentation is the result of my engagement with this challenging limitation of PO, and the question of how to make use of the approach within ethnographical settings, where empery is fluid, manifold, and complex.

The aim of this paper is to formulate proposals for a practice-related version of PO, to analytically take empirical complexity into account. I draw on my empirical case study for examples of theoretical and conceptual considerations. In the first section, I will sketch the theoretical framework of PO, trace its main assumptions and explore points of critique. The second section introduces my empirical case study and illustrates potential benefits and limitations in the application of PO. In the third section, I will argue for a practice-related reformulation of the approach. In order to carry out a practice-related PO, I introduce three analytical concepts—namely *plural ecologies* (Sprenger/Großmann 2018), *ontological consequences* and *contextual assumptions*—and illustrate these concepts by referring to empirical examples in the Resex TA case study.

My argumentation is based on ethnographic research between 2013 and 2018. In sum, I conducted 20 months of fieldwork in various communities of the Resex TA and within its administrative board. I collected empirical data by means of participant observations and informal conversations, supplemented by open and semi-structured interviews, and the evaluation of legal and archival documents. For data analysis, I made use of content-related coding and interpretative procedures inspired by Georg Breidenstein et al. (2013).

## Approaching Political Ontology

Political ontology refers to

»the power-laden negotiations involved in bringing into being the entities that make up a particular world or ontology. On the other hand, it refers to a field of study that focuses on these negotiations but also on the conflicts that ensue as different worlds or ontologies strive to sustain their own existence as they interact and mingle with each other.« (Blaser 2009b, 11)

This often-quoted definition sums up the research program of PO. The theoretical framework was first introduced by Mario Blaser (2009a; 2009b; 2013b), and further refined in collaboration with Marisol de la Cadena and Arturo Escobar (e.g., Blaser/Escobar 2016; Blaser/de la Cadena 2018). In my view, Blaser's analysis of a participatory sustainable hunting program among the Yshiro, an indigenous group of the Paraguayan Chaco, makes PO particularly tangible. In this case, Blaser identifies two opposing ontologies. First, a dualistic ontology based on opposites such as nature versus culture; following Bruno Latour (1993), this ontology is referred to as *modern*<sup>1</sup>. Second, a *relational* ontology, in which relations constitute being (for further elaboration cf. Blaser 2013a). These opposing ontologies become explicit in hunting practices and regulations; the Yshiro reproduce relational ontological principles, while the state, NGOs and scientists reproduce modern ontological principles. At one point, conflicts arise over hunting. This is not, according to Blaser, because Yshiro and external actors pursue different goals or express different opinions about sustainability, but primarily because their practices are part of different ontologies—because the metaphysical orders of relational and modern worlds require different sustainability strategies. Seen from that angle, there is no conflict over resources, but a conflict over the world and its ontological constitution. This leads to a process of ontological enforcement, in which Yshiro knowledge is explicitly identified as local cultural knowledge (and not as an alternative ontology) and is thus sucked into the modern dualism of one objective nature versus a plurality of diverse cultures. By having modern science (understood as objective knowledge as opposed to cultural perspective) on their side, the external actors manage to ensure dominance of their own ontology in decision-making processes (ibid. 2009b). I understand this dynamic as a process of *de-recognition through recognition*—the *recognition* of Yshiro knowledge as culture gives it a voice in environmental governance, but leads simultaneously to its *de-recognition* as an alternative ontology. With regard to co-management of natural resources, this means that as long as local knowledge is recognized as culture and not as an expression of alternative ontology, such processes of appropriation will continue.

Further studies of PO share this interest in power relations between a modern and a relational ontology. In the case studies, the modern ontology is represented by governmental and civil society actors or scientists, whereas indigenous or non-indigenous local populations represent a relational ontology (e.g., de la Cadena 2010; Bonifacio 2013; Gombay 2014; Glauser 2018; Petitpas/Bonacic 2019). Thus, »the power-laden negotiations« the PO is interested in always unfold between these collectives; ontological difference becomes the distinguishing feature between ontologically homogenous groups involved. This homogenization of social groups is part of an analytical strategy, Blaser explains. It enables a »shrinking of modernity« and raises awareness for the existence of alternative ontologies. By doing so, PO is able to engage situations of inequality in favor of modern actors and at the expense of indigenous groups, and to examine still existing postcolonial power asym-

metries (Blaser 2013b, 553). However, it is precisely this act of reduction which makes PO vulnerable to criticism, since the analysis ultimately results in a very modern juxtaposition of indigenous people versus the West (Bessire/Bond 2014; Erazo/Jarrett 2018; Bormpoudakis 2019). As a result, indigeneity becomes the West's Other, exploited to ultimately criticize Western thinking, as David Chandler and Julian Reid (2020) argue with regard to the ontological turn. Since Blaser and de la Cadena (2018, 5) define ethnography itself as a practice of world-making, the critique gains even more relevance.

While I agree with parts of the critique, I am still convinced that the perspective of PO enriches ontological anthropology because it addresses the structural dimensions of ontological enforcements and includes sensitivity to power inequalities within ontological multiplicity. Nevertheless, with regard to the analysis of my own ethnographic data, the approach encounters a limitation. The situation in the Resex TA does not adequately fit into the PO paradigm, since strategic homogenization and the juxtaposition of relational and modern actors would swallow too much ethnographic detail. I will illustrate my case study and these challenges in the following section.

### Ontological Multiplicity in the Resex Tapajós-Arapiuns

Sipping a small cup of sweet, hot coffee, I listen to my conversation partner Seu Júlio<sup>2</sup>. The elderly man bends his upper body over the wooden kitchen table, enthusiastically remembering a very successful hunt from a few years ago. Every now and then, his hands gesture through the air as he indicates the impressive size of the trapped tapir. Through the open window behind him, I spot the huge metal plate at the entrance of the village. It designates the communal area as part of the territory of Resex Tapajós-Arapiuns. (Fieldnotes 24.07.2016)

The Resex Tapajós-Arapiuns is a conservation area for sustainable resource use, founded in 1998 in the Amazon region of Brazil. It covers an area of 6,500 km<sup>2</sup>, situated at the conflux of the two rivers Tapajós and Arapiuns. About 20,000 inhabitants live in over 70 communities, nestled along the riverbanks. Like Seu Júlio, most residents secure their livelihood by hunting, gathering and fishing, as well as cultivating small-scale agriculture and raising livestock. No less important though are sources of monetary income such as pensions, child benefits or financial support provided by relatives living in the cities. Furthermore, village schools offer rare possibilities of wage labor. And so, despite the remote location, people regularly visit the nearest town Santarém to purchase food (Pena 2015).

Although my local interlocutors mostly identify themselves as *ribeirinhos* (dwellers of the riverbanks), in governmental terms they are defined as *traditional population*. Traditional population refers to the non-indigenous inhabitants of rural Amazonia, descendants of indigenous groups and Portuguese colonizers (Carneiro da Cunha/Almeida 2000). In the 1990s, a process of re-ethnicization started in many parts of Latin America, and in the region of this case study, an increasing number of residents started emphasizing its indigenous ancestry and to self-identify as indigenous (Bolaños 2008; Vaz Filho 2010).

By legislation, the 95 Brazilian Resex are co-managed by members of an administrative board composed of delegates of governmental agencies, civil society organizations and scientists, as well as representatives of the local communities. To ensure that local economic practices remain sustainable and to prevent over-utilization of natural resources, this administrative board must develop and approve a utilization agreement—a set of

binding rules and requirements for resource appropriation (Cardoso 2002, 150–170). In the case of the Resex TA, this utilization agreement was approved in 2013; since its ratification, it is the only formally binding normative order, which regulates all areas of local resource use.

Having studied the 52 paragraphs of the utilization agreement in detail, I feel optimally informed about relevant regulations in the Resex Tapajós-Arapiuns. And so I know, for instance, that every household possesses a private parcel of land, on which others may neither cultivate nor gather nor hunt. Accordingly, I am very puzzled when Seu Júlio breaks into laughter and explains: »And what do we do if game is escaping in the neighbor's land parcel? Do you think hunters stop at a property line, waiting for the next animal to come? No, no, this does not make sense. We—the community of Nova Canaã—decided that the whole land is collective land. We do not have private parcels here.« (Fieldnotes 24.07.2016)

My ethnographic data reveals various examples where practices of (and informal standards for) resource use in the communities differ significantly from the official utilization agreement. And so, unwittingly and largely unconsciously, a legal pluralism has emerged; regardless of the utilization agreement, daily subsistence practices within the communities often continue to be standardized by local norms (cf. Meurer forthcoming).

The legal pluralism further implies ontological multiplicity. This is also corroborated in the course of my conversation with Seu Júlio, who describes a powerful entity relevant to hunting permissions:

»As far as I know, and I've hunted a lot, you won't bag any game when Curupira is present. When she's there, she doesn't leave. You can't see her; you only perceive this particular feeling, hear her whistling. You know that when she is there, no game passes by.« (Fieldnotes 24.07.2016)

Curupira is one of many *encantados* (enchanted creatures) that are known in the Amazonian region and beyond. *Encantados* live in streams, rivers, lakes, caves and forests, and are very often entrusted with the protection of these habitats. Curupira is probably the most famous among them (Hoefle 2009; Almeida 2013). Her name varies—in some places, she is called Caipora, Kaapora or Caá-porá; as does her appearance and performance—while often depicted as a small, red-haired creature with feet pointing backwards to confuse hunters with false footprints, in the Resex TA, she stays invisible. While she is mostly given a masculine pronoun in literature, most of my interlocutors referred to Curupira as she/her. They did not recount stories of Curupira as the protagonist of abstract tales, but instead always referred to personal experiences that they or their acquaintances underwent somewhere in the nearby forest.

Accordingly, for many residents in Nova Canaã, Curupira is a very influential entity on the subject of hunting, and when searching for sustainability strategies, her influence should be taken into account; all the same, in the paragraphs of the utilization agreement, Curupira is absent.

The empirical case thus seems to be paradigmatic for situations of conflicting ontologies (in the PO sense). It shares some central characteristics with Blaser's case, including the context of co-management, the visibility of diverse ontologies that further lead to different sustainability strategies, and a certain hierarchy between the different ontologies,

demonstrated by the fact that Curupira was not included in the official utilization agreement.

And yet, the complexity within the Resex TA limits a productive application of PO. In the Resex TA, it is not possible to identify clear opposing groups of actors, nor to define one social group—or even one individual—that consistently enacts one particular ontology. Instead, social affiliations are everchanging and numerous, and individual's actions are ontologically diverse. Let me reinforce these observations with ethnographic detail.

First, although similar to the studies of PO cited above—wherein multiple stakeholders engage in processes of co-management—in this instance social boundaries are not static nor clearly defined. Due to the dynamics of re-ethnicization, the boundaries between indigenous and non-indigenous actors are blurred and constantly shifting. And because NGOs, academia and (to a lesser extent) even governmental agencies employ local staff, it is hard to draw a distinction between local and external actors. Accordingly, since social affiliations are neither static nor mutually exclusive, they do not adequately explain ontologically different world-makings.

Second, the situation becomes even more ambiguous when considering the heterogeneity of daily practices. Different ways of world-making cannot be surmised by knowing the identity or social belonging of the acting subject. To the contrary, my data indicates a variety of situations where the same person enacts quite different ontologies, as the following examples illustrate. An interlocutor in the village of Nova Vista (a non-indigenous *ribeirinho* in his forties, without any scientific background and a delegate of his community in the administrative board) reported some of the most impressive and frightening encounters with Curupira, somewhere up in the woody hills. This same man is more than fascinated by the task of tracking the manioc fields of the community residents with a GPS device in order to regularize their location and scale. In his function as a member of the administrative board, he is responsible for this duty; a practice of regularization that (re)produces a very naturalistic idea of measurement and scientific management. Similarly ›incongruous‹ seems to be the statement of a forest scientist at the University of Santarém who, talking about my research results, ponders aloud: »Curupira is so important for forest conservation; if only we could somehow verify her existence in our data...« (Fieldnotes 24.09.2018). These two brief examples should suffice to illustrate that ways of world-making and enacted worlds can ontologically differ within the practices of a single individual.

How to make sense of this ontologically complex and vague ethnographic situation, taking into account that other empirical studies (e.g., DeVore 2017; Theriault 2017; Haug 2018) indicate that this situation is not an anomaly?

### Concepts for a Practice-Related Political Ontology

Due to the strategic homogenization in studies of PO, these fluid daily dimensions remain in the blind spot of the approach. I argue, though, that they could be analytically integrated within a practice-related reformulation. This idea is suggested implicitly in the work of Blaser (2013a, 21–24). He conceptualizes ontology by defining three intertwined dimensions. Following Amazonian anthropology (e.g., Viveiros de Castro 1996; Descola 2005), ontology refers to a metaphysical principal of order, that defines and structures being and its relations (a). Following science and technology studies (e.g., Mol 1999), ontology is constantly (re) enacted in practice (cf. Jensen this issue) (b). Both dimensions are highly interconnected;

while practice is structured and organized by metaphysical ontological principles, practice itself must be understood as a moment of metaphysics production (c).

For empirical analysis, this three-dimensional conception of ontology offers two possible approaches. First, the focus of analysis can be on the metaphysical orders (dimension a), while studying its reproduction in practice. Or second—conversely—the focus of investigation can be on practice (dimension b), analyzing the production and the enactment of realities with particular ontological orders (Blaser 2013a, 24). In my opinion, these two ways of approaching ontological diversity result in slightly different analytical focal points, whose further consequences are underexposed in the framework of PO. I contend that, even if studies of PO do not disclose their analytical steps in detail, they usually progress in the first direction. For instance, through his conversations with local experts (Blaser 2010, xi), Blaser gains in-depth knowledge of Yshiro metaphysics and its relational ontological principles (dimension a). Knowing about these principles, practices are interpreted, and it becomes evident that the Yshiro reproduce and reaffirm their ontology in decisions for a particular sustainable hunting strategy. This direction of analytical progress reveals the importance of metaphysics in practice and its (sometimes conflicting) consequences. However, the analytical lens can only make sense out of practices that reproduce an already-known metaphysical ordering; those practices that do not inevitably fall out of theorization. This makes it enormously difficult, I argue, to make dissonant voices meaningfully audible and to theoretically integrate the empirical complexity found in my case study (cf. Meurer forthcoming).

Since my goal is the integration of these alleged empirical inconsistencies, I suggest rotating the analytical perspective by 180 degrees and traveling the second analytical route: to focus on practices and enquire after their multiple ontological enactments (dimension b), and thus to perform a practice-related version of PO. To do this, I propose applying three conceptual tools (cf. figure 01). First, I will turn to the concept plural ecologies as defined by

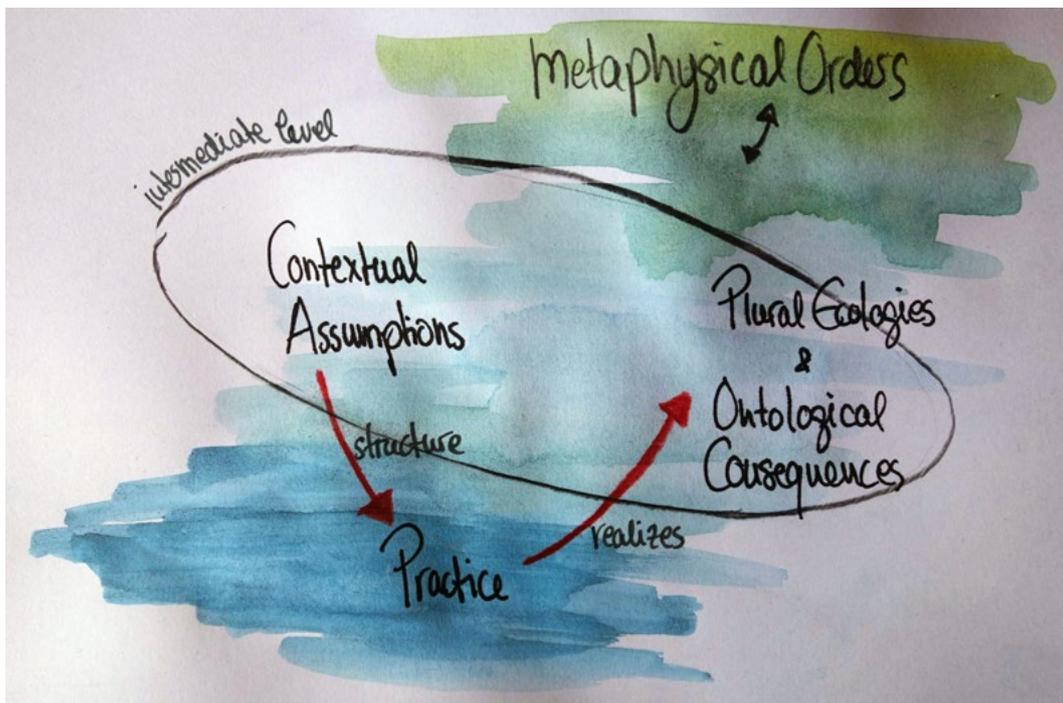


Figure 01: Concepts for a practice-related political ontology (drawing by the author)

Guido Sprenger and Kristina Großmann (2018) and to the term ontological consequences in order to grasp the ontological dimensions enacted in practice. I illustrate the two concepts with reference to examples drawn from my case study (Curupira and carbon). Second, I will introduce the idea of contextual assumptions to analyze ontological relations of power within specific settings of practice. I will demonstrate the use of this concept by asking why Curupira is absent from the utilization agreement of the Resex TA.

## Plural Ecologies and Ontological Consequences

### Example I: Curupira

As elaborated above, some of the norms for resource appropriation in the community of Nova Canaã (as in other places of the Resex TA) indicate the relevance of Curupira. For example, there is the recommendation to avoid hunting in excess, since Curupira penalizes such practices, or to stop hunting if she comes nearby, since there is the threat of physical danger when she is enraged. I interpret these norms as components of world-making processes, as they enact specific realities with particular ontological patterns. In this way, norms for subsistence offer a starting point for the exploration of reality in terms of a practice-related PO.

To grasp the enacted realities, I use the concept of plural ecologies. Sprenger and Großmann (2018, ix) define ecologies as »a more or less coherent set of relationships between humans and non-humans«, implying »specific conceptions of beings and relationships«. Since these specific conceptions vary, ecologies must be thought of as plural. They are (re)produced in practice and are therefore not stable, but processual and contextual. By focusing on the relationships between humans and non-humans, this concept enables the exploration of enacted realities in ontological multiplicity. It offers a necessary openness for my empirical case study because it assumes that »individuals and groups are not bound to one ecology but can be engaged in different ecologies at the same time« (Haug 2018, 342).

In this sense, the listed norms for resource use concerning Curupira realize a specific ecology, a particular relationship between residents (humans) and Curupira (non-human). The ethnographic data reveals a variety of characteristics. The relationship consists, for instance, of equally conscious, and equally acting subjects. Curupiras' above-described interventions in hunting demonstrate that agency is not limited to the human role; to the contrary, human and non-human actively and mutually shape their relationship. This relationship can feature different qualities—varying from violent to friendly to cooperative—depending on the particular human individuals involved and the specific situation of engagement. Regardless of these different qualities, all resident-Curupira relationships in Nova Canaã exhibit a distinct sociality between humans and non-humans; they establish social bonds that clearly transcend the boundaries of the human realm (Meurer 2020, 88–92).

The enactment of this specific ecology implies further ontological consequences, a term I define as the implicit aspects and dimensions within a particular ecology (e.g., a certain form of epistemology, rationality or temporality). For instance, within the ecology of residents and Curupira, a specific epistemology holds true: the ethnographic data indicates that knowledge about the existence of Curupira is based primarily on lived experiences. Thus, what I was told about Curupira related exclusively to the personal experiences of my interlocutors or their close acquaintances. Meanwhile, more abstract forms of knowledge production—whether objective measurement procedures or abstract cosmological assumptions—did not appear to be necessary, nor to be valid epistemologies. Furthermore,

this particular ecology implies a specific rationality; in this context, certain actions become logical and needful, while others are not possible. In order to hunt successfully, for instance, it makes absolute sense to remain reserved and humble, possibly carrying a little bit of the sugar cane liquor *cachaça* as a gift for Curupira; whereas, obtaining permission from the environmental agency of the Brazilian government ICMBio, is out of question. As previously noted, I integrate these observations under the concept of ontological consequences—a term inspired by a line of thought originating with Annemarie Mol (1999, 81). She demonstrates that different medical diagnostic procedures enact slightly different ontological versions of a disease. This implies further »reality effects« such as specific gender conceptions, for instance. I similarly argue that, within a certain ecology, further ontological consequences are equally realized—a specific epistemology or rationality, but also certain causalities, temporalities and finally sustainabilities.

By integrating the concepts of plural ecologies and their ontological consequences, I introduce an *intermediate level* to Blaser's conception of ontology. This intermediate level can analytically mediate between the concrete practices (dimension b) and the abstract ontological structures (dimension a). Having analyzed dimension b by applying the notions of plural ecologies and their ontological consequences, it makes sense to consider dimension a. It is, for example, obvious that the ecology of Curupira does not fit into the dualistic ontological oppositions of modern thinking, but instead blasts a nature-culture and associated subject-object dualism. It can thus be revealing to investigate similarities to relational ontologies (Blaser 2009a), as well as to other anthropological models like perspectivism (Viveiros de Castro 1996) or animism (Descola 2005). The integration of such possible references will further enrich the investigation of plural ecologies.

### Example II: Carbon

Considered from that analytical angle, the plural norms for resource use in the Resex TA reveal further ecologies. One example, that differs significantly from the residents-Curupira relationship, could be established within the framework of a planned project of REDD+. REDD+, the mechanism for *Reducing Emissions from Deforestation and Forest Degradation* aims to reduce forest destruction and degradation by establishing financial incentives to forest conservation. In short, REDD+ values intact forest stands in the Global South as carbon sinks. If local populations, initiatives or governments can demonstrate a reduction in deforestation, emission certificates are issued and generate revenues for the respective forest protectors. Carbon emitters, often companies in the Global North, can in turn purchase the certificates to offset their emissions. From the perspective of those who believe in market-based solutions for climate change, REDD+ represents a win-win situation for all the involved stakeholders (Hufty/Haakenstad 2011).

Starting in 2014, the administrative board of the Resex TA discussed the implementation of a REDD+ project in an effort to finance the conservation area's management through the sale of emission certificates. The implementation would have given rise to a fundamental transformation in local resource use and would have modified its regulations, as a resident of the Resex TA fears:

»Then we would no longer be able to work in the forest. We would no longer be able to cut wood, that we need—that we really need—for our everyday life! We wouldn't be able to create manioc fields anymore... the only thing we could still do would be to watch the forest!« (Informal conversation with Seu Tibério, 11.12.2015)

Unfortunately, Seu Tibério's evaluation could indeed be correct; under a REDD+ project, particular areas of the Resex TA would have to be designated as protection zones and their use would necessarily be restricted completely (or at least to a very large extent).

Hence, implementing a REDD+ project would inevitably lead to new norms for local resource appropriation. As with the example of Curupira, these norms must be considered as particular moments of world-making, enacting specific ecologies with ontological consequences. Within this ecology, too, a non-human entity (carbon) plays a crucial role for resource use—even though its relationship to humans is shaped very differently. To begin with, we can observe a clear subject-object relationship. The human entity appears as the acting subject that intends to protect forests, regulate emissions and manage carbon stocks. The non-human entity, by contrast, is treated as a passive object—a chemical element that is managed, counted and controlled. In addition, this seems to be a hierarchical relationship, even though this hierarchy is more ambiguous than it appears at first glance. On the one hand, agency is clearly vested in the human partner, while carbon is merely dealt with. However, in the context of the global climate crisis, human dependence on carbon is becoming increasingly obvious. Human and carbon mutually depend on each other, being reciprocally in hierarchy to each other. Regarding further ontological consequences, certain epistemologies and rationalities can be identified. It is not the empirical experience that foremost constitutes a valid epistemology; rather, abstract carbon accounting measurements and calculations produce knowledge about what is real and what is not—and about what is valid and true and what is not (cf. Knox 2020). A rational practice is not a reserved and humble behavior (as seen in the ecology of Curupira); the conversion of carbon into a monetary value is intended to propel people into action. A specific rationality ultimately results in particular strategies for sustainability (cf. Blaser 2009b). This means that just as ecologies are plural, so are the supposedly rational strategies for sustainability. This last aspect is of crucial political relevance today.

Finally, an inquiry regarding metaphysical structures reveals clear references to a dualistic, modern ontology. I contend that a subject-object divide (reflecting a culture-nature divide) characterizes the ecology of carbon crucially. Furthermore, certain beliefs—in an independent market, in individually acting subjects and in a measurable and manageable nature—are fundamental facets within this ecology, three basic assumptions of modern world-making, as Arturo Escobar (2017, 83–91) states.

However, as of today, the REDD+ project has not been implemented in the Resex TA. The proposal was suspended in August 2015, when indigenous activists occupied the building of the government environmental agency in Santarém. Even so, many interlocutors are sure that, in the future, similar projects will again appear on the agenda of the administrative board. »The project was not extinguished, but only temporarily suspended«, Seu Tibério clarifies (Informal conversation, 11.12.2015). If this proves to be the case, carbon and its ecology, in one way or another, will become an influential agent in local resource usage and in the production of reality.

Returning now to an examination of concepts. A practice-related PO enables us to investigate additional ecologies that fit less easily into anthropological models of modern or relational ontologies, but still become relevant in practice. One striking example are the numerous community associations in the Resex TA. These associations are responsible, among other things, for local conflicts over resource use. But it is also through these associations that residents are represented in the administrative body. Accordingly, they are influential more-than-human entities with regard to the negotiation of resource use and regulation within the Resex TA. I will not elaborate further on this example but will con-

clude with a short reflection. A practice-related approach—investigating practices and tracing the ontological characteristics of enacted ecologies—demonstrates that we are dealing with plural ecologies within the same empirical context. These ecologies differ ontologically, namely in terms of existing human and non-human entities and their relations. As in other ethnographic contexts (e.g., DeVore 2017; Haug 2018; Sprenger 2018), it is the same social group (or even the same individual) whose practices realize not one but plural ecologies.<sup>3</sup> A practice-related PO is capable of addressing this ethnographic density of plural ecologies because it stays open to the possible multiplicity of diverse enactments in practice. Additionally, its open perspective allows for a plurality of enacted ecologies—even if they cannot (or can only indirectly) be related to the metaphysical orders as described in anthropological theory.

### Contextual Assumptions

I have hitherto presented two concepts that trace the ontological effects of specific practices. By adding the term contextual assumptions, I propose to consider the particular conditions under which certain ecologies come into being while others are damned to non-existence.

Practice is not realized within a vacuum, but is always pre-structured by context, by preceding events and practices (Giddens 1984; Ortner 2006). Moreover, agents act based on certain »pragmatic presuppositions« (DeVore 2017, 15) that also touch ontological dimensions. To come to terms with this fact analytically, I propose to appraise the unquestioned contextual assumptions, that axiomatically permeate specific settings and thereby structure respective practices. They operate *axiomatically* in the literal sense of seeming »obviously true and therefore not needing to be proved« (Cambridge University Press 2014), and thus are widely *unquestioned*. They are *ontological* because settings are not solely permeated by assumptions about appropriate (or inappropriate) conduct, habitus or language, but also by presuppositions regarding existence—on what is and what is not even possible. As a result, contextual assumptions *structure* (not determine!) practice; the actors involved, taking assumptions for granted, align their practices accordingly and thus, reproduce them.

Seen from that angle, the plurality of ecologies within the empirical case of the Resex TA is indeed manifold and complex, but the specific enactments should not be interpreted as completely arbitrary. Here is a final example: The above description of the Resex TA and its legal pluralism ended with the observation that Curupira, although having a strong impact on subsistence practices in Nova Canaã, is non-existent in the utilization agreement. Nor was she mentioned in the numerous meetings of the administrative board that I attended between 2013 and 2018. How to explain Curupira's absence from the utilization agreement and in discussions of the administrative board?

Empirical data indicates that the actors' social and cultural belongings do not serve as adequate explanation. In other settings outside of the administrative board, many of the delegates make use of practices that recognize Curupira (or other non-human *encantados*). Interlocutors formulate hunting norms where she is a relevant actor; some of them ask for permission when entering specific habitats. They even requested the aid of a local healer when a forest management student disappeared during an excursion in 2016 and did not return until the following day because Curupira had confused her. These interlocutors include indigenous and non-indigenous participants of the administrative board; among them are delegates of local communities, as well as participating scientists and NGO staff.

Alternatively, it could be the dominance of government agencies within the administrative board that is suppressing ecologies which do not conform to their dualist modern conceptions. However, this does not seem very plausible to me; even the delegates mentioned in the preceding paragraph seem to enact Curupira's non-existence actively and enthusiastically within the administrative board. Focusing on the question of contextual assumptions, though, another interpretation reveals itself.

Based on my data, I maintain that particular principles have succeeded in becoming dominant within the administrative board and are now able to frame the space for discussion. These principals represent fundamental political norms for co-management of natural resources, a strategy of scientific management that strongly represents ontologically modern, naturalistic features (cf. Ioris 2008). Some of these principles are explicitly specified—laid down in manuals, statues, or environmental law. Other principles, perhaps the largest part, remain implicit but have solidified into collectively shared contextual assumptions, whose validity is not questioned at all within the administrative board's discussions. One of these contextual assumptions applies the modern axiom that a non-human is not, and cannot be a possible negotiation partner for resource use; Curupira is no more than local cultural belief. Because this contextual assumption dominates the particular setting of practice, the delegates do not include her into the utilization agreement. A process of *de-recognition through recognition* as Blaser (2009b) describes it in his case study seems to take place. But in this case it happens not between different social groups or stakeholders, but instead is jointly realized by an enormously heterogeneous collective. In this sense, it is not so much ontological oppression between different agents taking place; the ontological power relationship between plural ecologies appears rather hegemonic. The delegates actively participate in reenacting the dominant modern assumptions, thereby accepting its underlying ontological principles. This is not to say that other ecologies are not possible within this setting. I am convinced that they are, and that actors are indeed able to blur and de-stabilize the dominant dualistic assumptions—albeit, during my research, this did not happen.

Focusing on contextual assumptions in particular settings reintroduces PO's sensitivity concerning constellations of power to a practice-related analysis. In this way, the suggested approach specifically looks at moments of »power-laden negotiations involved in bringing into being the entities that make up a particular world or ontology« (Blaser 2009b, 11). Nevertheless, taking the complexity of ethnographic fluidity seriously leads us to a slightly different understanding of processes of ontological enforcement. As outlined above, they seem to be hegemonic and not a product of clear oppression or uncontrolled ontological equivocation.

## Conclusion

This paper maps the critical engagement between empirical data and the theoretical framework of political ontology, leading to my proposal for a practice-related reformulation (cf. figure 01). To this end, I suggest exploring the ontological dimensions of empirical case studies by focusing closely on practices and the realities they enact. To come to terms with these realities, I propose making use of three analytical concepts. The first is the idea of *plural ecologies* (Sprenger/Großmann 2018), understood as particular relationships between human and non-human entities and their specific ontological characteristics. The second concept is that of *ontological consequences*, valuable for analyzing additional features orig-

inating from particular ecologies—for example epistemologies, rationalities, causalities or, not least, sustainabilities. The third concept, *contextual assumptions*, enables the consideration of particular settings of practice and their potential influence on the enactment of specific ecologies (and the non-enactment of others). It helps to identify dominant assumptions—supposed ontological certainties—within specific settings and thus, integrates the analysis of power relations and ontological hierarchies into a practice-related political ontology.

Above all, a practice-related political ontology stands out by virtue of its analytical openness to empirical complexity. Since it chooses practice (and not ontologies, worlds, or social groups) as its analytical starting point, this approach is able to capture ontologically different ecologies, regardless of whether they differ between social groups, between individuals or within the practices of a single actor. The approach is furthermore able to consider the whole variety of realized ecologies, whether they bear resemblance to modern or relational ontologies, or whether they express entirely different ontological structures. Within a practice-related framework of political ontology, empirical complexity thus need not remain trapped in thick description; it can be thoroughly examined and contribute to a thick analysis of ontological processes of power.

## Endnotes

- 1 Modern in the sense of Bruno Latour refers to the characteristic ontological classification of modernity. Emerging in the age of the Enlightenment, it is primarily organized around two great divides: the fundamental distinction between nature and culture; and the distinction between those who are aware of the nature-culture separation (we) and those who are not (the others) (cf. Latour 1993; Blaser 2009a). I learned that the term quickly misleads, as its general usage implicates strong value connotations. As it is fundamental for Blaser's argumentation, I will still make use of it in this paper. For an alternative understanding of modernity that does not exclude indigenous subjects, but instead highlights the multiple and multifaceted interconnections of indigenous and non-indigenous worlds, see Ernst Halbmayer (2018).
- 2 Names of interlocutors are pseudonyms.
- 3 This multiplicity also extends to the normative orders for resource use in the Resex TA; both the utilization agreement and the norms in Nova Canaã are ontologically fragmented, each of them establishing in themselves a plurality of ecologies.

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# Practical Ontologies Redux

Casper Bruun Jensen

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**ABSTRACT:** *In this article I provide an overview and mini-genealogy of practical ontology and ontologies. Originating in sporadic formulations by Bruno Latour and by Geoff Bowker and Susan Leigh Star in the late 1990s, practical ontology provided a handle for thinking through issues relating to non-human agency and the composition of uncommon worlds, an emerging focus of interest in parts of STS at the time. Following a discussion of some these threads, I describe how practical ontology has subsequently been shaped in conversation with two partly related approaches: the ›ontological turn‹ articulated in *Thinking Through Things* and onwards with inspiration from Eduardo Viveiros de Castro and Marilyn Strathern, and political ontology given shape by Mario Blaser and Marisol de la Cadena. After touching upon issues including ethnographic concept-formation and the aim of anthropology, the existence or otherwise of a one-world world, and questions of ontological politics, I end by suggesting that practical ontology assists in helping keep up to speed with the surprises of the multiverse.*

**KEYWORDS:** *Ontological Turn, Political Ontology, Practical Ontologies, Practical Ontology, STS*

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»But if we now speak of factishes, there exist neither beliefs (to be fostered or destroyed) nor facts (to be used as a hammer). The situation has become much more interesting. We are now faced with many different practical metaphysics, many different practical ontologies.« (Latour 1999, 287)

»Someone, somewhere, must decide and argue over the minutiae of classifying and standardizing. The negotiations themselves form the basis for a fascinating practical ontology—our favorite example is when is someone really alive? Is it breathing, attempts at breathing, or movement? And how long must each of those last? Whose voice will determine the outcome is sometimes an exercise of pure power: We, the holders of western medicine and scions of colonial regimes, will decide what a disease is and simply obviate systems such as acupuncture or Ayurvedic medicine.« (Bowker/Star 1999, 44–45)

In *Two Lectures*, Michel Foucault (1980, 92f.) remarked on an »increasing vulnerability to criticism of things, institutions, practices, discourses«, which he associated with a shift from totalitarian (universal, abstract) theories to forms of »local criticism«. They had ena-

bled the discovery of »a certain fragility...in the very bedrock of existence«. And they had done so by returning to knowledge; not least by paying close attention to »an insurrection of subjugated knowledges«.

Now consider the two introductory quotations. In *Pandora's Hope*, Bruno Latour (1999) argued for replacing the dichotomy between fact and fiction with factishes, neither quite one nor the other. We would then be faced with many different practical ontologies. Around the same time, Geoffrey C. Bowker and Susan Leigh Star (1999) argued that negotiations over standards and classifications—for example to determine when somebody is dead or alive—form the basis for a »fascinating practical ontology«. I will have more to say about variable inflections of this concept but for now simply observe the proximity to *and* distance from Foucault's diagnostics. Proximity: a focus on things and practices that engenders recognition of fragility *in* the bedrock of existence. Distance: Local criticism centering on diverse knowledges *about* particular bits of existence.

As the quotes show, the terms practical ontology and ontologies circulated in Science and Technology Studies (STS). But they weren't particularly central. At the time, I picked them up because they encompassed various (then) unorthodox ideas relating to non-human agency and changing compositions of worlds, which facilitated experimentation with partially related concepts in STS and philosophy (especially via Isabelle Stengers, Gilles Deleuze, and Michel Serres) (Jensen 2004). Unbeknownst to me, one or more anthropological ›turns‹ to ontology were taking form more or less simultaneously, but not exactly in parallel, since the routes and inspirations were partially overlapping, converging, and diverging (Jensen 2017).

This text provides a conceptual genealogy of sorts of practical ontology. The genealogical aspect is visible as a tracing of how the concept has allowed ideas and arguments of different origin to come together, mutually interfere, or bounce off of each other. If it is a peculiar genealogy, or one only *of sorts*, it is due to its performative orientation. That is, rather than an abstract delineation of a generic theory, the text makes explicit my own experimental endeavor at concept construction and elaboration.

This endeavor has been shaped by many concrete events and ongoing conversations, including the 2009 colloquium on »Comparative Relativism« at the IT University of Copenhagen (Jensen 2011); the 2010 Manchester debate on whether »the task of anthropology is to invent relations« (Venkatesan et al. 2012), the 2014 conference »The Social and the Human« in Tokyo, which led to the creation of the open-access *NatureCulture* journal<sup>1</sup> (Kasuga 2012), and the »Politics of Ontology« panel held at the 2014 AAA conference in Washington D.C. (Holbraad et al. 2014)<sup>2</sup> during what can only be described as a time of peak ontological rage—in the double sense of being simultaneously all the rage and raged against. Other crucial sources of inspiration come via long-term Danish and Japanese collaborations (Gad et al. 2015; Jensen/Morita 2015) and exchanges with Marisol de la Cadena, Marilyn Strathern, and many others.

From all of this, I learned much about both the capacities and limitations of practical ontology as I originally envisioned it. And this accounts for some of its arguably more interesting and quirky features, not least an inclination to expansion through metamorphosis. To the extent that it is a concept at all, it is therefore certainly a collective, experimental one, which continues to evolve through borrowing, tweaking, or stealing.<sup>3</sup>

This complexity, too, poses a problem of exposition. I begin by making explicit some of the original STS sources, before commenting on the relations between *practical* ontology and, respectively, the so-called ›ontological turn‹ in anthropology and *another* PO, *political* ontology. To cover as much ground as possible, I sketch the scene as a series of conversations. After describing what (practical) ontology meant in STS, I show how proponents of

the ontological turn in anthropology reacted to these ideas, and how some, myself included, responded in turn. Then I explore the mutual interferences of the ontological turn and political ontology, and the lessons that their differences and similarities, in my view, allow one to draw. I end by suggesting that practical ontology assists in helping keep up to speed with the surprises of the multiverse.

## Ontology in STS

What, then, characterizes practical ontology as an orientation, or practical ontologies as constellations to be explored? I begin with the tantalizing invocations of »many different practical ontologies« *from the inside* of STS. In each their ways, Latour, Bowker and Star articulated the idea that realities are negotiated, somewhere in-between, or to the side of, dualisms like ›fact‹ and ›fiction‹. Thus, practical ontologies locate us in the vicinity of concepts like Andrew Pickering's (1995) ontological performances and Annemarie Mol's (1999) slightly later enactments. Rather than finding ourselves in a world pre-constituted by a set of basic ontological building blocks, we are observers of, and participants in, worlds, which are shaped by proliferating and transformable elements and agencies: human, non-human, and more-than-human (cf. Heitger et al.; Kumpf; Sørensen/Laser this issue).

The sense that there is no ultimate ground but rather innumerable simultaneous efforts to create and stabilize variable ›grounds‹ was captured by Latour's (1988) evocative term ›irreduction‹. It was also highlighted by Mol (2002, 5) who insisted that we must give up the idea of a »static object in the middle«, which different actors have merely different »perspectives« on. Pickering (2005, 30) made a similar point, when he objected to the idea that even though there is a real, »material world«, people never encounter it »in its raw state« but always »drenched in meaning«. The issue is not that meaning doesn't exist, but rather that it operates in dualist accounts as a circuit-breaker that cleanly separates the outside world from the inside of our minds or societies. As an alternative, he argued for placing ourselves in the thick of things. Bypassing the distinction between mind and matter, we would be able to observe diverse agencies coming together in »dances of agency« that reciprocally tune and unpredictably modify all of them.

All of which means that practical ontologies, rather than structured or defined by extant dichotomies like objects and subjects, nature and culture, or reality and beliefs are assembled or networked by unpredictable and heterogeneous agencies in a dispersed, distributed manner. It is possible or even plausible that they are patterned, and they may achieve temporary unity, if not provisional harmony, but they have no central control room.

But doesn't this leave practical ontology constitutively unable to either critique the *status quo* or induce change? With noticeable repetitiveness each and all of the ontological approaches in STS continue to be criticized, and occasionally flogged, along those lines (cf. Eitel/Meurer this issue). And it is not very difficult to understand why. Critique, after all, is premised on having rather stable targets (actors, objects, institutions, ideologies). They are interrogated with concepts and categories that are also quite stable and assumed to be up to the task (think of habitus, self-organization, the means of production, or race/class/gender). In this way, to use the words of Alfred N. Whitehead (1966, 173), critical repertoires tend to assume the existence of something like »a perfect dictionary« for making sense of social, cultural, and political situations. But practical ontology renders these targets fuzzy, or causes them to disperse. As for the dictionary, it is no longer assumed to be either fully written or perfect, but rather potted and in serious need of updates.

Even so, it would be quite wrong to conflate the absence of conventional critique in practical ontology with a disinterest in intervening in urgent, ›critical‹ matters of concern (Jensen 2020). A good illustration is Charis Thompson's (2005) *Making Parents*, which, by depicting regimes of infertility treatment as an »ontological choreography«, provided a simultaneous counterpoint to those who equated any medico-technical interventions with a demeaning objectification of women's bodies and to those who uncritically celebrated and promoted each and all new reproductive technologies. By carefully examining the changing and variable ontological choreographies of bodies, selves, and technologies in the clinic, Thompson was able to show that the notion of a general or universal opposition between agency and objectification is a chimera, and that non-reductive forms of objectification may enhance the agency of women in particular circumstances.

Quite a different example is found in Helen Verran's (2002) studies of postcolonial moments temporarily emerging within »microworlds« where Australian Yolngu people and environmental scientists tried to learn from each other about different strategies of land management. Verran observes that such learning can be extraordinarily challenging when participants bring incongruent concepts, rooted in fundamentally different cosmologies, to the table. However, she also points out that cosmologies and their concepts, rather than free-floating, are »clotted as routine sets of practices« (Verran 2018, 112). The embeddedness of cosmology in practice makes it possible to experiment with creating minimal ontological bridges that provisionally facilitates mutual understanding and collaborative coherence.

In a way, this takes us in the direction of Foucault's interest in subjugated knowledges and Verran indeed also aspired to interrupt power relations and redistribute authority. Signaling her disinterest in defending the purity of any cosmology, however, the powerful idea that fragile bridges are sometimes sufficient to traverse apparent ontological chasms also takes us beyond knowledge. Instead, the attention to clotted, material practices locates us squarely in the thick of things, where the positions of actors become ambiguous as practical ontologies mutually infiltrate. While ways of knowing—concepts as »working units of cosmologies«, including our own—are certainly important, many other things are thus also happening. All of which is to say that while knowledges, discourses, and perspectives neither encompass nor underlie practical ontologies, they are also not irrelevant. As I have previously written, epistemology in practice collapses into, and becomes an element in, ontology (Jensen 2004).

At this point, it can be argued that the term practical ontology is too imprecise and narrow for what I am making it do. After all, ›practical‹ sounds very much like everyday, routine or mundane, and while this was originally useful as a contrast to the idea of abstract metaphysics, it doesn't seem sufficiently plastic to encompass the wild divergence of agents and relations actually populating worlds. Arguably, empirical ontology (Law/Lien 2012) or metaphysics does a better job in this regard. However, in my view these terms carry along a different set of problems; not least an implied contrast between the empirical and the conceptual (Jensen 2014). Since no term is either pure or perfect, I have stuck with practical ontology while continuously trying to make it looser and suppler. In this endeavor, as noted, I have been fortunate to receive instruction from a wide variety of sources. Among them are some affiliated with anthropology's much debated ontological turn.

## The Ontological Turn in Anthropology

Meanwhile, in anthropology, Eduardo Viveiros de Castro (1998, 2005) was giving shape to the concept of multinaturalism. According to Amazonians like the Araweté, many different beings, like tapirs, spirits of the dead, or jaguars, see themselves as human, and others as non-human. This is a world of perspectival differentiation: since the jaguar perceives itself to be human, it sees its human prey as a pig. As jaguars, spirits, and humans all inhabit the same ›cultural‹ universe (they are all human) while their universes vary according to bodily differences and affects (what is a pig for one is a human for another), multiple natures replace the idea of endless cultural perspectives on a single, self-identical one.

This idea resonates with practical ontology in some fairly obvious ways. For one, there is the general orientation to exploring very different ontologies. For another, these ontologies are populated and relationally shaped by many actors and beings. Presumably, this is also why Latour has occasionally used multinaturalism for his own purposes. In terms of expanding practical ontology, however, the differences are as important as the similarities.

Among these is what can be called the difference between connection and relation (cf. Strathern 1991; 2011a). Due to its origin in STS, practical ontology has always been very attuned to the mutual shaping of subjects and objects, and to the co-construction of science, technology, and society in practices involving heterogeneous actors. For this reason, the emphasis has been on the observable, material connections that scientists or engineers create as they pursue their projects, build their technologies, and extend their networks. Confronted with Amazonian shamans traveling the night in the borrowed body of a jaguar, however, this mode of description reaches a dead end. It is entirely possible to see people gathering, preparing herbs, and drinking or smoking, without being able to grasp what truly matters in the situation: the nocturnal journey with its risks and transformations, and the ›non-material‹ relations through which effects take hold on actors involved. Thus, the difference between material connection and a more open-ended sense of relations puts significant pressure on the *practical* part of practical ontology. Evidently, this term must be separated from the idea of the material and mundane and loosened sufficiently to encompass the dreams of the traveling shaman.

*Thinking Through Things* (Henare et al. 2007), which introduced the ontological turn in anthropology, had other objections to STS in general and Latour in particular. Centrally, the editors questioned how open to variability actor-network theory really was, given its commitment to the form of the network. Somewhat disingenuously, they described the Actor-Network-Theory (ANT) as a universal theory that forces everything onto its procrustean bed.

Before accepting this contrast, it is worth noting that the original description of the two-step heuristic method of the ontological turn fits almost perfectly with both Latourian irreductions and practical ontology. First, the editors explain, the anthropologist should refrain from ascribing to the ›thing‹ any *a priori* characteristics (Latour: first, do not presume to know what an actor is). Second, you should allow ethnographic materials to guide your alternative conceptualization of what the thing is (Latour: second, trace the actors and let them define their own reality for you). Still, there is as little to be gained from smoothing over the differences as from exaggerating them. I am far more interested in exploring how the contrasts can be methodologically and conceptually activated.

If it is clear that one cannot follow the shaman's flight by sitting next to his twitching body, it is equally clear that one cannot examine the chemical effects of the herbs he has ingested without going to a laboratory. Once the shaman returns, he will be able to tell sto-

ries placed within the cosmological universe to which they belong. But this version of what is ontologically at stake exists alongside those of climate scientists, construction engineers, planners, and agricultural migrants who are simultaneously performing the practical ontologies of the Amazon in very different ways (Jensen 2015).

It follows that much hinges on one's orientation to ethnographic materials and on the questions that guide and motivate description (cf. Mol 2011; Strathern 2011; 2011a). Multinaturalism explores Araweté ways of existing, but it also comes packaged with a marked resistance to the subsumption of indigenous people by mainstream Brazil, which manifests in Viveiros de Castro's strong emphasis on ontological difference. In contrast, Martin Holbraad's (2012) studies of Ifá divination in Cuba aim to understand how a certain powder is turned into a conduit for articulating the indubitable, and how that might render »motive« the anthropological conception of truth. Compared with the cosmopolitical subtext of Viveiros de Castro's multinaturalism, there is no overt politics to this conceptual transformation, which Holbraad elsewhere describes as the signature move of the ontological turn.

In a newer exposition, Martin Holbraad and Morten Pedersen (2017: 220f) connect the ontological turn with an interest in the »conceptual affordances« of things. Analogous to Tim Ingold's adoption of the term material affordances (Gibson 1986), which can be understood as perceivable action possibilities—the door knob ›affords‹ the possibility of opening the door, and the chair ›affords‹ sitting—they suggest that things contain particular conceptual affordances congenial to the anthropological concept transformations that hold their interest.

At first glance, this appears to take us back towards the material connections originally emphasized by practical ontology but actually it marks another contrast. First, the authors in fact admit their inability to gauge the conceptual affordances of things via their material characteristics. In their words, powder or shamanic artifacts do not invite particular conceptualizations »entirely of their own accord« (Holbraad/Pedersen 2017, 239) but, *alas*, as parsed through the people surrounding them. We are thus left with a »thing-driven *component*, or *phase*« (ibid., emphasis in original) of analysis, which effectively returns us to the sleeping shaman, whose nightly journey will be narrated after he awakens. Once again, the thing becomes the story of its effects as told by people (»drenched in meaning«), even though it may also make those people do many things they would not themselves ascribe to the thing (Jensen 2017b).

From the point of view of practical ontology, the problem is not that the ontological turn fails to identify the material properties that actually do underpin the conceptual affordances of a thing. It is, rather, that the search is fruitless, because things are relational composites that change over time. And this relates to a certain conservatism at the heart of affordances, which, after all, can go no further than describing how things have been used *so far*. For example, agricultural implements have a proven track record of ›affording‹ the preparation of soil for planting crops. However, a visit to the Tuol Sleng genocide museum in Phnom Penh exhibits the many ways in which they can also, under certain circumstances, at a certain point in time, as part of particular constellations, become torture instruments. Today, analogously, many regular fixtures of urban environments can be experienced as props for parkour (perhaps on account of changing perceptual orientations enabled by video gaming). And recent protests in Hong Kong have shown that an unexpected affordance of hand-held vacuum cleaners is to repel tear gas.

In my view, the fact that material affordances change as soon as people imaginatively repurpose objects puts a significant dampener on its usefulness as a conceptual rubric. This

feeling is perhaps intensified because practical ontologies attune one to the surprises of non-human agency.

In summary, it can be said that the ontological turn has provided a series of instructive object lessons for practical ontology. It has facilitated an expansion of material connections into explorations of more free-ranging relations »from science to dreams and back again« (Deleuze 1994, 220), and provided ample demonstration of the power of experimentally working fresh ideas out of ethnographic materials. At the same time, the turn seems constricted by its rather narrow emphasis on the continuous reinvention of anthropological concepts.

The premise of practical ontology, in contrast, is that the empirical and the conceptual shape each other in complicated patterns, which are not amenable to disentangling (Gad/Jensen 2010; Jensen 2014). Accordingly, it embodies a speculative disposition to activate heterogeneous resources for performative, re-descriptive purposes. This is exhibited in the edited volume *Deleuzian Intersection* (Jensen/Rödje 2009), which interweaves Deleuze and Latour with Strathern's anthropology via Gregory Bateson, and brings into conversation varied, partially connected studies of cybernetic ontologies (Andrew Pickering), the world of codecs (Adrian Mackenzie), Amerindian filiation (Viveiros de Castro) and explorations of social movements in advance of later examinations of political ontology and the pluriverse (Arturo Escobar/Michal Osterweil), which I will presently consider.

## Political Ontology

If the ontological turn exhibits a degree of cosmopolitical timidity, the same cannot be said of political ontology (Blaser 2009), which was also taking shape around the time. With inspiration from Arturo Escobar, Marilyn Strathern, Isabelle Stengers, and parts of STS (especially Annemarie Mol and John Law), this approach and its cognate indigenous cosmopolitics (de la Cadena 2010) orient ethnographically to conflicts over the composition of the world. In contrast with political ecology, which takes nature as given and examines political conflicts over its resources, political ontology finds no common measure between the Atîku known by the Innu people and the biologically defined caribou (Blaser 2018), which Canadian wildlife manager and policy-makers assume to be the same entity, or between Ausangate as an Andean mountain and as an earth-being (de la Cadena 2015).

For political ontology, resource conflict is a reductive term for wars about worlds, which encourage anthropological explorations of ontological divergence (cf. Schiefer this issue). Rather than inhabiting a consensual or hegemonic common world, we are situated within a pluriverse or an uncommons (Blaser/de la Cadena 2017). Similar to the ontological turn and practical ontology, ethnography is conceived as a »concept-making genre« of »concrete abstractions« (Blaser/de la Cadena 2018, 5) that must be simultaneously site-specific and capable of movement. But as the name also indicates, these abstractions get a particular political inflection. Mario Blaser likes to invoke John Law's (2011) notion of a »one-world world«—the view that ontology is singular—to characterize what political ontology fights against on behalf of the pluriverse.

Here is an important difference between the ontological turn and political ontology. Offering a critique similar to the one of ANT, Martin Holbraad (2013, 564) argues that political ontology, by »grounding« itself in multiplicity and fluidity, as if these were inherent characteristics of any setting, inescapably overdetermines ethnography. How, he asks, »is the possibility of different differences not canceled by Blaser's prior story of what those differences

must look like?» And how different *are* those differences, actually, if they can be captured by »such modish concepts as emergence, performance, fluidity, and so on«?

In reply, Blaser (2013, 566) observes that the heuristic proposed by the ontological turn »hinges on a foundational claim of what anthropology is about«, namely, encountering alterity and extracting alternative concepts from the engagement. This is fine, he argues, as long as making new concepts is the endgame of anthropology. The risk, however, is insularity: concepts in motion as a pastime for anthropological connoisseurs that offers little to anybody on the outside, like the Atiku herders trying to keep their lifeforms and ontology intact.

As I see it, Blaser and Holbraad pose some mutually relevant challenges. However, once again, I am less concerned with adjudication than in using their differences to push practical ontology further. Surely, we are not beholden to the vocabulary of emergence, performativity, and fluidity, and these terms may be irrelevant or even counter-productive in specific cases. Yet, unless we want to continuously reinvent language, they are useful in orienting to open-endedness and resisting easy reductions. Conversely, of course, there is no intrinsic reason why concepts created by the methodological heuristics of the ontological turn should be unable to escape anthropological parlor salons and create differences in the world. However, experimenting with such possibilities requires keeping anthropology's own ontology motile, rather than boxing it in as a disciplinary genre of concept-making.

In my view, the central point of divergence between political and practical ontology relates, also somewhat paradoxically, to the apparent faith of the former, qualifications notwithstanding, in the existence and powers of the one-world world. With a view to creating room for other ontologies, Blaser rightly rejects the idea that modernity is something everybody either inhabits or aspires to. Even so, the one-world world evokes a series of stark dichotomies that tend to rigidify ontological differences. If, for example, Blaser's initial discussion pertains to some specific and problematic relations between Innu people and environmental NGOs about how to handle Atiku/caribou, it gets a panoramic inflection as illustrative of the exclusionary dynamics of the modern one-world world in general.

This trajectory is rife with potentials for relativization. To begin, the idea of a one-world world is not particularly Western, since many non-Western people indeed also think their distinctive form of reality is... reality. As Law (2011) notes and Blaser repeats, the real problem is therefore not the existence of one-world worlds but rather the successful dominance of a particular one-world world over others. Once the one-world world is blown up to a quasi-universal level, we end with the West, or Europe, which become the big others in stories of ontological opposition.

But this ballooning effect has its own dangers (cf. Meurer this issue). If political ontology is performative, as Blaser rightly insists, while his stories constantly talk up the capacity of ›Euro-America‹ or ›the West‹ to impose and dominate across the board, then *he* is performatively contributing to enhancing that capacity and reifying a single macro-ontological difference. If, instead, one begins from the observation that both ›the West‹ or ›Europe‹ are ontologically as holey as a Swiss cheese, and moreover hardly aware of their internal differences, this facilitates descriptions of cross-cutting practical ontologies as a lattice or patchwork of uncommon, but not unbridgeable, micro-worlds.

The philosopher Isabelle Stengers (2018, 84) makes a related point in somewhat different terms. In agreement with political ontology, she argues that taming »wild divergence« by fitting fit many worlds into one (for example by reducing earthbeings to mountains) will not do. But she also insists on the importance of recognizing differentiations within ›modernity‹ or ›the West‹, between, as she writes, »agents of modernization« and others »with

whom diplomacy might be possible« (ibid., 86). This is an image of practical ontologies as (not) adding up to an uncommons; full of gaps and frictions, obscure zones, or wormholes. Rather than confined ›within‹ an ontology, actors are able to exceed them by moving in many directions and dimensions, and by creating unlikely, sometimes successful, new cosmopolitical alliances.

Within its own context, the cross-pollinations of STS, anthropology, and philosophy found in the special issue on comparative relativism, in *Deleuzian Intersections*, and in the pages of *NatureCulture*—from the first volume (Jensen 2012; Mol 2012; Viveiros de Castro 2012) to Yoko Taguchi's interview with Marisol de la Cadena about politics and earth-beings<sup>4</sup> and the more-than-human-worlds blog series edited by Paul Hansen, Gergely Mohácsi and Emilé St. Pierre<sup>5</sup>—illustrate the potentials of such alliances.

### Keeping Up to Speed with the Pluriverse

A question that weaves in and out of the preceding discussion is whether we should be speaking of *practical ontology* in the singular or *practical ontologies in the plural*.

Once again, a comparison with the ontological turn is instructive. In response to Blaser, Holbraad (2013, 563n33) notes that he came to see his previous association of ontological differences »with the image of multiple worlds« as a regrettable, »highly misleading reification of an essentially analytical procedure«. Far from elucidating what a thing or phenomenon is, Holbraad insists, the ontological turn is a strictly intra-anthropological method aiming at concept construction. And so, the question of worlds, their ingredients and composition, falls to the wayside.

In contrast, practical ontology is certainly about heterogeneous worlds: social and technical, divine and infrastructural, scientific and economical, and much else. In the singular, practical ontology is a *profoundly open-ended orientation* to exploring how and by whom such worlds are performed, maintained, challenged, transformed, or destroyed. In the plural, it describes *specific and distinctive worlds* in terms of their composition, maintenance, etc.—as described or otherwise performed by the researcher.

As described or otherwise performed by the researcher? The problem of exposition resurfaces. Are we not right back to epistemology and Foucault's problematics of knowledge with which the introduction began? Are we not confronted, once again, with the reflexive issues that always haunt anthropology? The answer is ›not quite‹. And this is because description now emerges as just one way of doing practical ontology—and thus contributing to compositions of the world—alongside fishing, writing policy memos, searching for COVID-19 vaccines, and whatever else those we describe are doing. As long as one imagines research as a mapping exercise aimed at adequate representation of an object sitting passively »in the middle,« this is bound to appear disappointing, if not scandalous. But with recognition that the object itself isn't there—except as relationally elicited, performed, and enacted by everyone involved in practical ontology—the problem space changes.

Consider the water flowing in the Mekong river. At one and the same time, it is incongruously performed as models by earth system scientists, as the lifeworld of catfish, as the embodied navigation space of fishermen, as the abode of trickster water deities, as the engineering problem of dam designers, as site of transboundary conflicts by policy makers *and* as complexly interwoven practical ontologies by the researcher (Jensen 2017c; 2019). We cannot imagine the latter as a uniquely conceptual elaboration of the varied but merely empirical activities of the former, since they are all, simultaneously involved in conceptu-

alizing their experiences and situations, and in performing and navigating whole yet *uncommon* worlds in which both ›water‹ and ›the Mekong‹ are multiplicities. Located on the inside of practical ontology, our own descriptions morph into small-scale experiments in world-building, speculative propositions, which are placed among those of everybody else.

The situation has now become very interesting. As Latour wrote, this is in part because we are always faced with many practical ontologies. Comprised of elements and relations quite beyond the ›everyday‹ or ›mundane‹, and extending in many directions and dimensions, they provide rich opportunities for fresh thought. But as we are entangled with these ontologies, the situation is *also* interesting because our descriptions, analyses and activities contribute to shaping worlds, together with, or in opposition to, everybody else.

And this means that, even if it is often true that the one-world world wins, as when Western medicine and colonial regimes run roughshod over acupuncture or Ayurvedic medicine, this outcome is not given. Ontological surprises can emerge from lateral alliances between Yolngu people and ecologists, science fiction writers and climate scientists, or between anthropologists and their diverse friends and interlocutors (Danowski/Viveiros de Castro 2017). Divergent ontological constellations—from earthbeings (de la Cadena 2015) to amphibious infrastructures (Morita 2016; Sangkhamanee 2017) and toilet leviathans (Chalfin 2017)—continue to exceed conventional politics.

If it is worthwhile to experiment with practical ontology, it is thus not due to an impossible ambition of getting *on top of* these proliferating events. More humbly, but no less interesting or important, it is simply to try, as best we can, to *keep up to speed with the pluriverse*. And, in doing so, perhaps also playing our part *in keeping cosmopolitics alive*.

## Endnotes

- 1 This open access journal is found at <https://www.natcult.net>.
- 2 The full set of position statements is at <https://culanth.org/fieldsights/series/the-politics-of-ontology>.
- 3 As an aside, it also accounts for the many citations, including excessive self-citations, in this text.
- 4 See <https://www.natcult.net/interviews/an-interview-with-marisol-de-la-cadena/>.
- 5 See <https://www.natcult.net/series/more-than-human-worlds/>.

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