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WASTE AND GLOBALISED INEQUALITIES

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Facing Frictions: Waste and Globalised Inequalities

> "In the interplay of ruin and possibility […] lie alternative and more open forms of commitment." Anna Tsing (2004: 267)

Waste is inherent to the global economy of the "permanently polluted world" (Liboiron et al. 2018) in which we are living. This has been suspected for quite some time now, also induced by spectacular public narratives. The global garbage crisis announced in the 1980s and 1990s provided numerous popular accounts of waste-catastrophism – from Neal and Schubel's *Waste Management and the environment: The Mounting Garbage and Trash Crisis* (1987), Gourlay's *World of Waste* (1992), to Griffin's *Garbage Crisis* (1992), among others. An often recurring feature of such accounts has been its tendency to make all people equal in face of humanity's risk of drowning in its own waste. It is a powerful narrative, still brought up every now and then. Just think of recent discussions around plastic pollution in the oceans. However, it is as wrong today as it was 30 years ago.

There is nothing (normatively) equal in the way people are entangled in and affected by the production of waste and processes of wasting. The consequences of waste and pollution are shared unequally, laying the ground for vast injustices. However, because of global production networks, the mobility of certain types of waste, and the continuous material transformations in wasting practices, they are still a matter of global connections – as sociologist Zsuzsa Gille (2007: 27) reminds us – "dealing with wastes has become a more collective and global task".

Much has been written (in academia) about the routes waste takes and the wasting practices that shape these patterns (Hird 2014; Rathje/Murphy 2001; Gregson/Crang 2015). The recent case of "poor quality" and

"contaminated" (Laville 2018) plastic waste materials from UK households finding their way to Malaysia, Vietnam, Poland, Turkey and Brasil after China's 2018 ban of waste imports is a vivid example of the thrust of the global inequalities, on which such deliberate realignments of global waste flows are based. But this is not what the present special issue is primarily concerned with. Rather, we want to draw attention to the fragmentations and conjunctions, the contingencies and consistencies that occur when processes of wasting unfold their distinct dividing powers – in many different places, but with strangely aligned patterns. Trajectories of waste hinge on, relate to, and re/produce global inequalities.

Our introductory piece brings the different contributions to this special issue together. Yet, our text is more than a summary. We make the case for a particular perspective, while focusing on three guiding questions. In which ways is the production of waste matter linked to inequalities? How do processes of wasting enact particular sites of injustice? Additionally, in which forms do those inequalities and injustices appear? We need a refined apparatus – theories, methodologies and stories – to engage with these questions. Drawing on anthropologist Anna Tsing's innovative research (Tsing 2004), we suggest that one needs to *face frictions* through waste to make sense of the particular global connections and related inequalities and injustices. Friction, Tsing argues, enables global connections; likewise, "friction reminds us that heterogeneous and unequal encounters can lead to new arrangements of culture and power" (Tsing 2004: 5). To emphasise the work and stress that is required to establish a global connection, we from now on prefer to refer to the notion of 'globalised'. We thus understand the production of waste as a matter of global connection that is always articulated in specific historical conjunctions which are socially informed, and therefore subject to specific power relations.

Our article thus aims to set the stage for a systematic reflection of globalised inequalities and injustices. We begin by revisiting and evaluating central claims in the burgeoning field of Waste/Discard Studies. Here, we especially focus on how scholars dealt with inequality and injustice. Afterwards, we suggest the notion of facing frictions as a methodological tool with which to study global inequalities and injustices, which is also used to introduce the contributions to this special issue.

1. Waste, discards, and spectres of inequality

Since the turn of the millennium, critical social science research on waste has been growing rapidly, which is captured by the notion of 'Waste' or 'Discard' Studies. Our article does not offer a systematic introduction to the field in general (see Moore 2012; Gregson and Crang 2015; Dines 2018; Reno 2015; Millington and Lawhon 2018; Evans 2011; see also the open-access journal *Worldwide Waste*). However, it nonetheless makes sense to appreciate the substantial work done by the pioneers, that is, anthropologists Mary Douglas (1966) and Michael Thompson (2017 [1979]), and to understand how their early research paved the way for today's scholarship on waste.

Douglas and Thompson championed a social-constructivist approach, according to which waste appeared as a relational entity. Douglas' seminal definition of dirt as matter out of place (1966) pertains to the spatiality of all things wasted, rather than their materiality (Gille 2013), whereas the 'correct' place results from social-spatial orderings. Thompson followed this perspective but, on top of this, developed a social theory of rubbish in which waste is a key category (coined "covert") through which things move to become valuable entities. This theorisation has been an important step towards the formation of Waste/Discard Studies. If we approach the literature on waste through the lens of globalised inequalities, however, we can see that discussions around environmental justice in the 1980s and 1990s enabled today's critical reflections. These discussions can be understood as politically engaged supplements to Douglas' and Thompson's pioneering theoretical work.

1.1 On the impact of environmental justice movements

There is a long history of instances of local resistance against the siting of waste treatment and disposal facilities that has been largely framed (or rather, abridged) under the NIMBY-label (Not In My Back Yard). Such resistances implicitly addressed the spatiality of waste, already highlighted by Douglas, in its confluence with symbolical 'dirtiness' and disorder, and at times also touched upon the bio-physically hazardous characteristics of different kinds of waste. Yet, it was the environmental justice movement in the United States that established a clear relationship between the siting

of such waste infrastructures as well as polluting industries in general, and the disproportionate exposure of Black, Hispanic, Native American, working class and other marginalised communities to toxic and industrially polluted environments (United Church of Christ Commission for Racial Justice 1987; Bullard 2008, 2001). This North American movement and its engaged (academic) knowledge production exposed the entanglement of social inequality and environmental injustice with the politics of waste treatment and disposal. It attended to the "historical socio-spatial processes that produce marginalized populations and that create and unevenly distribute environmental risks" (Moore 2012: 783; Heiman 1996). In doing so, it revealed how environmental racism structures the way US society deals with waste, and how the spatial politics of waste treatment and disposal are governed by white privilege (Pulido 2000, 1996).

The engaged political perspective developed by the environmental justice movement inspired environmental struggles worldwide, including in countries of the Global South, and contributed to what Guha and Martinez-Alier (1997) would later call "Environmentalism of the Poor". However, this truly global reception departed from the pronounced emphasis on the socially unequal and unjust distribution of environmental 'bads' – particularly in light of oppressed and marginalised social groups' exposure to industrial toxic wastes – that initially characterised the environmental justice movement in the United States. Instead, a much stronger focus was put on continued access to and protection of environmental 'goods' and their defense against the enclosure and destruction of commons.

This tension between environmental 'goods' and 'bads' already points towards one central theoretical argument that we have to confront, if we are to look at waste through the lens of globalised inequalities and injustice: waste always unfolds a certain ambiguity. It involves an ambivalent and emergent valence (Corvellec 2019). In an initial but slightly simplified step, we might describe this as the *double character of waste*: it always carries with it potentially 'negative' as well as 'positive' framings. What waste is to become depends on the position and perspective of those connected and connecting to it. Typical vantage points for such an engagement with waste are values, orders and the materiality of waste. The latter perspective is key to the formation of Waste/Discard Studies. As Gregson and Crang (2010: 2017) noted: it was "[e]nvironmental justice's

emphasis on the hazardous nature of various wastes" that really "brought back in the material properties of different forms of waste" after the social-constructivist approaches of Douglas and Thompson. Today, many Waste/Discard Studies scholars embrace a more 'materialist' perspective, although this ranges from historical-materialism to new materialism, with all kinds of intersections from and to post-structuralist approaches on the way. Non-humans are included in the analysis; waste materials and their impact are taken seriously; and waste's indeterminacy has been identified as a fundamental problem one has to deal with. Before we enlarge upon different perspectives on waste-related inequalities, a final note on terminology is needed.

What is the difference between Waste and Discard Studies, and why are there two terms to describe one field? And why do we merge the two – writing Waste/Discard Studies? We do not want to emphasise a strict distinction between waste and discard, but it is worth noting that some scholars see a certain danger in working with a vague and too broad understanding of waste – especially in the globalised context. This is what advocates of Discard Studies argue, a loose team of scholars mostly coming from North America, who also run an academic blog (see discardstudies.com, and the interview with Liboiron in this issue). The argument is unfolded as follows: "Unlike studies that take waste and trash as their primary objects of study, Discard Studies looks at wider systems, structures, and cultures of waste and wasting." (Liboiron 2018) Discard Studies scholars thus embrace a critical perspective, pushing researchers to "question the premises – the assumptions of what seems natural, normal, logical, and inevitable – of waste to investigate the wider systems that allow things to seem natural, normal, logical, and inevitable in the first place." (ibid.) However, many 'Waste Studies', we would argue, do exactly that: they question the nature of waste, and its naturalisation in much of today's public discourses surrounding waste. Thus, we will not throw the notion of waste studies in the bin, largely because of its continued popularity in key contributions, and, crucially, because of the ease of the term 'waste'. Talking about waste helps start a conversation. Everyone knows how to connect with waste (even if that means by pushing it aside as quickly as possible, to free oneself from 'disgusting' things – which translates to caring for one's self; see Hawkins 2005). This is a good backdrop for facing

inequalities: you can connect with people and things. With this in mind we can now move to a brief review of different takes on inequality in recent Waste/Discard Studies.

1.2 Waste and globalised inequalities from three perspectives

Inequality is a major theme in Waste/Discard Studies, even though various scholars theorise it quite differently. In fact, we would argue that spectres of inequality haunt the examination of each and every study on waste related topics, even if some avoid explicitly conceptualising it. For the purpose of this special issue, we propose differentiating between three broad strands of approaching inequalities and waste (instead of offering a systematic analysis of how questions of inequality reverberate in the whole field of Waste/Discard Studies, which is beyond the scope of this introduction): (1) the capitalist accumulation of waste and inequalities; (2) the governance of waste; and (3) the matter of waste. These are just ideal-types; besides, various authors could be affiliated with more than one strand.

The *first strand* of literature takes the coupled production and allocation of waste in the global (capitalist) economy either as a metaphor to describe or as a source to understand globalised inequalities. In its metaphorical use, waste serves as a marker of distributional injustice in the allocation of wealth and pollution. In its analytical deployment, the accumulation and revalorisation of waste and waste-related inequalities is predicated on and explanatory of uneven capitalist development and the logics governing the capitalist pursuit of surplus value. It is hard to deny (even for neo-classical economists) that the global economy is producing a lot of waste (or 'externalities'), and that the environmental burden of this waste is shared unequally – which is illustrated by the notion of "pollution heavens" and its popularity in environmentally inspired studies of the global economy (e.g., Marconi 2012).

A first strategy to transcend such explanations of waste production and allocation based on simple market logics is achieved by recourse to the particular functional and spatial perspectives developed by "global commodity chains" (GCC, e.g Gereffi/Korzeniewicz 1994), "global value chains" (GVC, e.g. Gereffi et. al. 2005) and "global production networks" (GPN, e.g. Henderson et al. 2002) approaches. Such case studies focus

primarily on the "afterlife" and "on-going-ness" (Lepawsky/Mather 2011: 243) of high-value goods, such as the destruction and recycling of e-waste (e.g., Kirby/Lora-Wainwright 2015), ships (Gregson et al. 2010) and cars (Brooks 2012), but include also case studies on garment recycling (Norris 2015). They reveal that the global trajectories of "end-of-life" (Gregson et al. 2010) commodities are much more complex than suggested by the pollution heaven thesis or simple centre-periphery models (Gregson and Crang 2015), and instead have a lot to do with the differential value of wasted goods and materials (Crang et al. 2013). Yet, such approaches tend to focus more on distributional justice as encapsulated in economic inequalities (Piketty 2017) – the distribution power, income and wealth. Moreover, besides their valuable contributions to our understanding of the spatio-temporal trajectories and material transformations enacted by recycling networks, such accounts often tend to focus (implicitly or explicitly) on how the global power of capital permeates into local contexts.

A second strategy deploys an explicitly Marxist approach to highlight the close entanglement of waste and value in the (re)production of waste-related inequalities within the uneven geographies of capitalist accumulation. The work on "global destruction networks" (Herod et al. 2013; McGrath-Champ et al. 2015) conceives the global trajectories of wasted materials as the "political economy of the passage of value/congealed labour from one product to the next in the recycling process" (Herod et al. 2013: 425). For that purpose, these authors introduce the insightful distinction between processes of "devalorization" that describes the 'normal' wear and tear that deprive commodities of their value/congealed labour, and processes of "devaluation" that pertain to the 'wastage' of commodities before they have actually reached their "end-of-life". This differentiation of capitalist processes of wasting provides a number of links to existing analyses of planned obsolescence and is particularly useful in understanding the political economy of formal recycling in the Global North. It is strongly aligned with earlier Marxist accounts that describe capitalist waste as the result of unabsorbed over-accumulation (Baran/Sweezy 1966). Yet, as Samson notes, it also shares with some of these older approaches an inability to account for the particular articulations of waste-related inequalities within post-colonial political economies of recycling: "all of their examples focus simply on how differing labour costs and health

and safety regulations in the global North and global South lead [global destruction networks] to take different forms in these locations" (Samson 2017: 43).

Post-colonial political economies of recycling are often described by reference to the informal character of recycling activities. A number of scholars who engaged with recycling economies in India (Gidwani/Reddy 2011; Gidwani 2015; Reddy 2015) and South Africa (Samson 2015, 2017) have deployed a different Marxist approach, which is inspired by feminist and post-colonial theory and more centred on labour and the reproduction of capitalist social relations, to advance our understanding of the peculiar informality in capitalist entanglements of waste and value. In close interaction with a renewed interest in ongoing processes of primitive accumulation (Federici 2004; Sanyal 2014; De Angelis 2001) and their reframing as accumulation by dispossession (Harvey 2010) from the early 2000s onwards, these contributions have outlined the interrelations between the informality of waste work and the destruction, dispossession and devaluation accompanying uneven capitalist development. Gidwani and Reddy have emphasised that the notion of "waste" itself is deeply entrenched in the early history of capitalism and associated processes of primitive accumulation, thereby "designat[ing] the unenclosed common, the external frontier" (2011: 1626) of future capitalist accumulation (see also Schlitz, in this issue). In present-day urban India, "'waste' has become society's internal and mobile limit […] a fiercely contested frontier of surplus value production" (Gidwani/Reddy 2011: 1625; Reddy 2015; Demaria 2010). This is why Gidwani and Reddy (2011: 1625) consider "waste" to be "the political other of capitalist 'value', repeated with difference as part of capital's spatial histories of surplus accumulation". Similarly, Berg found a direct link between suppressive capitalist relations and the handling of discards. She argues that "everyday garbage practices invisibly but consistently reproduce the social, racial, and environmental inequalities that pervade (and in fact order) capitalist societies more generally." (Berg 2016: 81). Handling waste, it turns out, serves as a stabiliser of structural inequalities, including the pollution of lives and lands. This is where the politics of waste receives attention.

The *second strand* of literature discusses inequality by focusing on the governance of waste. One central take-away message of Waste/Discard

Studies is to consider the way in which the conditions and consequences of waste are shaped differently in different social settings. Governance needs to be put into perspective. Some arguments appear in multiple studies. What is frequently questioned, however, are technological fixes, 'end of pipe' technologies in particular, that is, solutions suggesting that it is possible to get rid of wasted things in the first place – and most probably through capital- and technology-intensive infrastructures, from incinerators to 'high-tech' recycling mechanisms, with the help of rigorous collection schemes. This has been found to be problematic, because in fact only a minority of actors involved in global recycling networks benefit from such schemes. Global economies of recycling call for a more rigorous analysis (Alexander/Reno 2012). Additionally, but equally importantly, technical 'solutions' are not sufficient in terms of preventing huge amounts of (hazardous) waste in the first place (not to speak about the issue that even the most technologically advanced recycling schemes in the Global North barely capture more than 60% of the so-called post-consumption waste) (MacBride 2011). As the environmental justice literature has taught us (Dillon 2014; Taylor 2014), the side-effects of these failures, once again, are hitting marginalised social groups disproportionately.

Several Waste/Discard Studies argue that modern 'solutions' to waste 'problems' tend to stabilise and reintroduce the issues they claim to treat (Gabrys 2011: 150; Gille 2007: 25). From a more general perspective, this insight helps us to grasp the link between social hierarchies and their governance. Scholars draw on a variety of methodological approaches to unravel such all-encompassing power politics surrounding waste and pollution, while pragmatist heuristics (on issue-formation, see Marres 2007) and Foucauldian approaches (on environmentality, see Agrawal 2005) are the most prominent.

How do problems become problems in the first place (defined by whom and what, pushed by whom, to the detriment of whom or what, etc.)? This question is a pivotal one, and it helps us to learn fundamental things about structural inequalities. Along these lines, Hawkins (2005), Corvellec et al. (2013) and Hird et al. (2014) investigate when and how particular waste issues become public issues (or stay private matters). Nicky Gregson and Mike Crang, in turn, emphasise the de-politicising side-effects of the governance of waste in terms of its management, framed by

disposal mentalities and translated into disposal technologies – "principally the established ones of incineration and landfill", although recently more and more "reconfigured as resource recovery" (Gregson and Crang 2010: 1026). Other studies here investigate the relationship between power relations and attitudes towards waste (Leonhard 2013). This is also prominent in research that untangles the histories of concepts of purity – and the way in which societies are structured by excluding certain people and social groups due to their association with matters of cleanliness/contamination (Campkin/Cox 2007; Moisi 2015; see also Iyer, in this issue). Some here also emphasise a link between modernity's consumer culture and the way in which lives/people are 'wasted' (Baumann 2004; Adkins 2018). And, last but not least, ethnographic encounters aid the discussion of such matters from a more intimate perspective. Peter Little, for instance, relates the story of *Toxic Town* (2014), IBM's first US-American manufacturing plant that, decades after its closing and despite a variety of superficial technical measures, continues to be a source of health-related problems for the local inhabitants. Beyond these numerous studies, we would like to highlight one conceptual framework that turns out to be particularly useful in approaching governance.

Gille proposes the notion of "waste regimes" to reveal how waste is governed in different historical phases. In her 2007 book *From the Cult of Waste to the Trash Heap of History,* this is used to develop a nuanced account of how waste was framed in Hungary in the early-, late- and post-socialist eras. In this account, local and transnational influences are brought together (she merges actor-network theory and Marxist approaches; Gille 2010).

Gille's waste regimes are defined by three dimensions: the production, representation, and politics of waste. As a result, regimes can differ substantially, and they are understood to be in constant flux. Studying the three dimensions translates into a research programme that helps grasp governance comprehensively, we would argue. Production then refers to questions such as "what social relations determine waste production and what is the material composition of waste", representation centres on the knowledge surrounding waste and pushes questions such as "which side of key dichotomies waste has been identified with, how and why waste's materiality has been misunderstood, and with what consequences", while the politics of waste is linked with questions like "whether or to what

extent waste issues are a subject of public discourse, what is a taboo, what are the tools of policy, who is mobilized to deal with waste issues, and what nonwaste goals do such political instruments serve" (Gille 2007: 34). In a nutshell, waste regimes affect which handlings of waste are considered feasible (and which modes of governance can be imagined in the first place). This framework can thus be used as a powerful tool.

Consider the following example. The most important taboo that Gille describes has a major impact on inequalities on a global scale: the "taboo of production". While there are plenty of regulations concerning the recycling of waste, she argues that waste production (or more precisely, waste prevention) is hardly touched upon (for the example of electronic waste cf. Lepawsky 2018; see also the review by Laser in this issue). This is particularly problematic, since there is too much attention on household or post-consumer waste, because most of the waste that is produced and discarded occurs during research and design, and in the manufacturing process as well as during transportation (well over 90% of all waste out there apparently comes from industrial practices, and, of course, military waste; MacBride 2011; Krupar 2013).

The *third strand* of literature discusses inequalities from a more 'materialist' perspective, meaning by a renewed attention towards materials and materialities that is championed by Science and Technology Studies (STS) and the so-called new materialisms (Coole/Frost 2010). First and foremost, an interest in materialities in Waste/Discard Studies results from the indeterminacy of waste and pollution (what has been indicated above with the 'double character' of waste). Brian Wynne's *Risk Management and Hazardous Waste* (Wynne 1987) sets the stage for this discussion by highlighting that knowing waste has always to do with taming a unique type of indeterminacy (in risk theories this is described by using the notions of known and unknown unknowns), which goes hand in hand with power relations and inequalities (see also de Carvalho Vallin/Gonçalves Dias, in this issue). As a result, there is hardly any waste/discard study that does not grapple with a particular precondition or consequence of indeterminacy. Thus, to circumvent the impossible task of charting the entire landscape of explicit/implicit approaches on this, we would like to draw attention to an insightful discussion between two waste scholars, Myra Hird and Zsuzsa Gille.

In a 2012 article, Canadian environmental scholar Hird starts from the premise that all knowledge practices can basically be considered as practices in which indeterminate things are rendered determinate – in the form of temporal achievements. With the help of feminist science studies (Barad 2007, in particular) she merges epistemology and ontology, whereby lessons from the study of landfill waste help to underline the argument that we should embrace an "inhuman epistemology", "[t]urning human exceptionalism on its head" (Hird 2012: 463), by acknowledging that non-humans co-determine how things are made knowledgeable. With this, she negotiates inequalities on a theoretical level that promises a fresh perspective. From Gille's perspective, however, "she takes it too far", evoking the following reaction: "rather than calling for and making space for other modes of knowing for emancipatory purposes, she [Myra Hird] argues that we 'simply' need to reorganize and give voice to the inherent nature of matter as always-already indeterminate." (Gille 2013: 3) In her response to this critique, in turn, Hird emphasises the fertility of the particular research endeavour she is pursuing: "My aim", she justifies, "is to detail the myriad agential cuts that make waste a phenomenon (including the various political affiliations that attend these cuts), and advance an ethical approach that forefronts both the known and imprescriptible (political, economic, socio-cultural, environmental, and health) implications of living with waste." (Hird 2013: 31) Nevertheless, Gille has a point when she emphasises the side-effects of such research:

> "Toxic wastes, nuclear wastes, and a host of industrial by-products are actually quite determinate: while they may never be fully known in some theoretical sense, we certainly know *enough* about the dangers some of them or some of their key components pose. The question is not whether they are made determinate but whether they are made determinate enough to warrant regulation. Producers of waste, however, are interested in keeping the exact composition, the exact effects, and the exact amount of these by-products unknown. What are the concrete instances of making the determinate indeterminate in waste politics?" (Gille 2013: 4)

We do not want to take sides in this discussion, as both perspectives offer interesting insights – below we introduce a particular perspective to make use of such tensions. However, and having Gille's critique in mind, we can move to the inner circle of the discard studies-group (see above), who are eager to implement a research programme that critically discusses the polluters' responsibility. We could have discussed this topic under the other two ideal types as well, but we put it here because a reflection on materialities is key to this thinking.

Imaginaries of a waste-free society are called into question by Discard Studies, because such ideas tend to ignore structural inequalities and power relations. In the programmatic piece *The what and why of Discard Studies*, Liboiron (2018) puts it like this:

> "Power, privilege, and injustice can occur if things operate normally. Discard studies has a crucial role in pointing this out in debates, policies, crises, and solutions around waste. These critiques have to surface if we want to do waste *differently*. If discard is necessary for systems to hold together, to subsist and to persist, then differently organized systems are needed that fundamentally alter discarding. We are not talking about eradicating discards altogether. Fundamentally changing discarding means posing the question: how to discard well?"

Discarding well, from a new-materialist kind of view, indicates tackling the infrastructures which drive particularly problematic modes of waste production (for a general introduction to this link see Hird 2017). To understand the revelatory potential of this perspective, it is worth noting how infrastructures are approached in what is now known as "Infrastructure Studies" – a field shaped by STS theorisations. In their seminal work, Susan Leigh Star and colleagues (Star/Ruhleder 1996; Bowker/Star 2000) proposed studying infrastructures relationally. They argued that it depends on your position (which very often implies: if you are a user or maintainer of infrastructures) whether or not you see something as an infrastructure. Asking the question 'when is something an infrastructure' then demands researchers to look for moments in which certain actors and institutions fall from view, doing their work rather quietly or without being called into question. Infrastructures "tend to disappear (except when breaking down)" (Bowker/Star 2000, 34), and so do their inscribed poli-

tics. More recent approaches here focus on "infrastructuring" (Harvey/Jensen/Morita 2017), highlighting the practical effort of, and dynamics in, maintaining infrastructures (see also Gidwani 2015, for view on India's 'infra-economy').

From a Waste/Discard Studies perspective, then, two approaches to infrastructures are helpful. Scholars, first, ask why certain infrastructures and their negative consequences are out of sight (think of the oil and chemistry industries, which are discussed extensively in the so-called Energy Humanities, cf. Szeman and Boyer 2017; see also the interventional research on detecting and problematising pollution: Gabrys 2016; Davies/Mah 2019). Secondly, it is also worth learning about the people and other non-human actors who, often silently and without appreciation, are taking care of the stabilisation of a particular infrastructure, and who also do this by exposing their bodies to harmful surroundings on a long-term basis (Nixon 2011). There is huge potential in learning from the maintainers, cleaners and their entanglements (see also Eitel, in this issue). The potential is captured best by Steven Jackson's notion of "repair thinking" (Jackson 2014) – a perspective that can also be used to rethink the economy as a sphere (Graeber 2012). Either way, inequalities are embroiled in and co-constituted by "infrastructuring" work (particularly with waste). The temporalities and spatial manifestations of infrastructures are to be taken into account in order to recognise their inscribed politics, exclusions and devaluations.

In Discard Studies, new perspectives on wasting are also linked with new scientific practices. Liboiron et al. (2018) draw on Murphy's queer-feminist intervention of "alterlife" (Murphy 2017) to ask "how forms of life and their constituent relations, from the scale of cells to cultures, are enabled, constrained, and extinguished within broader power systems" (Liboiron et al. 2018: 336). This question resonates with the basic ontological and epistemological frictions engendered by feminist STS and new materialism in general. However, to follow up on the saturation of live-constituent interdependencies with power relations, a whole new set of situated methodologies is required. This is what animates the Civic Laboratory for Environmental Action Research (CLEAR) in Newfoundland. Researchers here experiment with new methods of doing research. They try to investigate marine plastic pollution differently: from acknowledging place-based-ness

and its scalar implications for science to new forms of accountability and the valuing of often devalued reproductive work in labs (see the interview with Max Liboiron, in this issue). An example of a 'radical' approach that comes out of this lab is to ask for consent to do research in the designated area (which also includes asking fishermen if one may use their fish). Such (politically) innovative epistemological and methodological approaches highlight the merit of a confluence of critical social science with natural sciences, which is one of the hallmarks of current Waste/Discard Studies.

This short and selective review of the burgeoning field of Waste/Discard Studies shows that inequalities and injustice are addressed from various perspectives. This body of research has elucidated how important it is to grapple with the subtle and not-so-subtle matters of wasting and discarding. What is a bit problematic, however, is that the research tends to disagree on how exactly to grasp the 'global' or 'globalised' nature of the things studied. We now propose to make use of the notion of 'friction' to grasp this global connections, while at the same time attending towards careful cooperation and collaboration across difference.

2. Facing frictions through waste

The forms of inequalities and injustice embroiled in processes of wasting, in the production, handling and valorisation of different forms of waste, can be condensed through what Tsing (2004) describes as "frictions" in global connections: "the grip of worldly encounter" (Tsing 2004: 1), that make global interactions possible and confine them at the same time, break their 'smooth running'. Even more so, the social study of waste and waste-related inequalities appears as a particularly pertinent way to attend to the "persistent but unpredictable effects of global encounters across difference" (Tsing 2004: 3), which are at the heart of Tsing's notion of friction.

Tsing's argument, first and foremost, is an antithesis to the neoliberal euphoria of the 1990s, in which a harmoniously connected globe was imagined – made possible by seemingly peaceful, neutral and almost unstoppable processes of globalisation. Nevertheless, there is no magic in global power. Focusing on friction helps us to decipher the power at work in global connections. However, it is problematic to simply go back,

as it were – for example to reaffirm differentiations such as a fixed understanding of centre vs. periphery. The world is more complex than that.

Methodologically, Tsing here draws on Arjun Appadurai's seminal article *Disjuncture and difference in the global cultural economy* (Appadurai 1990), where the author highlights the impact of fragmentation, complex overlappings, uncertainty and difference, all of which are said to be at the centre of global flows. "Friction" is a tool that wants to make use of this perspective. In her 2004 book, Tsing presents an ethnographic account of the rainforests of Indonesia, a contested place that was transformed in the 1980s and 1990s by capitalist interests (through deregulation, investments, deforestation, mining, but also through crisis and devaluation). This is a study of globalisation from the inside. Much is overlooked, the anthropologist argues, if we ignore the concrete actors and practices on the ground, and how they forge connections across difference.

> "Commodities seem so familiar that we imagine them ready made for us throughout every stage of production and distribution, as they pass from hand to hand until they arrive at the consumer. Yet the closer we look at the commodity chain, the more every step – even transportation – can be seen as an arena of cultural production. Global capitalism is made in the friction in these chains as divergent cultural economies are linked, often awkwardly. Yet the commodity must emerge as if untouched by this friction." (Tsing 2004: 51)

Friction is not a negative term, just as "awkwardly" is a marker for possibility (we will return to this notion below). This is crucial, because it also indicates that criticism is not necessarily the most important goal a study of inequalities has to be interested in. In fact, as discussions around the so-called Sociology of Critique remind us (Boltanski 2011; Latour 2004), sometimes it makes sense to refrain from any critique, and to rather learn from actors – to see how they themselves struggle and cope with particular situations and problems (while we may return to a critique at a later stage of research). What is key here is that scholars can hardly anticipate the consequences of a particular critical statement that stabilise structures that one wanted to destabilise (Boltanski/Chiapello 2007).

Nonetheless, with friction Tsing also critically addresses a second major liberal claim from the 1990s. In 1996, driven by the fear of growing tensions, Samuel Huntington famously put forward the diagnosis of a "clash of civilizations" (Huntington 1996). Tsing, in turn, argues that encounters across difference are not necessarily problematic – in fact, they are what encounters are made of. They can initiate compromises and empower marginalised actors (Tsing 2004: 6). These encounters are full of hope. In a more recent monograph, Tsing (2015) studies life in the ruins of capitalism (by following a valuable mushroom that is mostly harvested by marginalised workers and ironically thrives where nothing else seems to survive anymore), and she makes clear that she now *only* sees hope in the ruins. She finds aspiration in waste. The key question now and then is how and when is cooperation made possible – even though there is no consensus, and without a common ground, beyond narrow conceptions of solidarity (see also Hall 1996; Clifford 2001; Star/Griesemer 1989).

What is particularly problematic in Huntington's reasoning is his take on universal values – the West vs. the Rest. Here, Tsing develops a promising alternative coined "engaged universals". Instead of approaching universal values detached from practical experiences, and rather than abandoning universalism altogether, the focus is laid on practical experiences and unpredictable pathways. "Engaged universals travel across difference and are charged and changed by their travels. Through friction," she argues, "universals become practically effective. Yet they can never fulfil their promises of universality." (Tsing 2004: 8) This perspective, last but not least, is inspired by queer-feminist thinking, by Butler's "restaging" of the universal in the particular (Butler 2000). Universalism has its limits, which is precisely what this is about: pushing the limits; reusing and altering hegemonic notions.

Following Tsing, both equality and justice can be considered as universal claims that become meaningful only through worldly encounters, through friction, which in turn changes their meaning and direction (e.g., the historical situatedness of claims for environmental justice within the civil rights movement in the US and its reverberation in post-colonial contexts, e.g. India). The notion of friction enables us – and hopefully also readers – to make sense of the distinct articulations of waste-related inequalities and injustice reflected in the contributions to this special issue.

Waste enables, excludes and particularises (Tsing 2004: 6) what is revealed through all these contributions, for instance regarding 'formalised' recyclers and their ambiguous position (see Schulz; Hafner/Zirkl).

Social studies of waste do not merely benefit from Tsing's terminology (which has been shown by other waste scholars, too, see Gregson et al. 2016); Waste/Discard Studies also emphasise that it might be of advantage to focus on the supposed 'awkwardness' of encounters across difference. Recent scholarship in the field has shown that this is particularly true with the relationship between value and waste. Very often this relationship is framed in the form of a dichotomy. Where there is no value, there is waste, it is claimed. Greeson, Laser and Pyyhtinen (2019) show, however, that one key lesson from studying wasting practices is that waste does not merely (and magically) emerge, as a side-effect, at an imagined end of a value chain, beyond the market, as it were (Lepawsky/Mather 2011; Gille 2010). Wasting is ubiquitous and always part of valuing practices; values are constantly assembled and disassembled, which is why it is important to understand how waste shapes and transforms structures as well as hierarchies of value. Here, Alexander and Sanchez (2018) draw our attention to indeterminacies. Value-making categories, they argue, while building on research on classification and bureaucratisation, produce waste that resists classification. Hence the introduction of indeterminacy as a third "modality" which the authors associate with a "lack of recognition or incorporation in a given classification system; undetermined futures or directions; and a resistance to totalizing systems" (ibid.: 3). Both perspectives emphasise that waste opens up intermediate spaces of friction, offering different sets of methodologies to approach such spaces.

The 'awkwardness' that one encounters while grappling with the relationship between value and waste calls for a reflection of normative orders; and we suggest engaging with these normativities in a particular fashion: to face the friction through waste. Be it indeterminacy, or the political other of capitalist value, friction helps us to make sense of the ambivalent possibilities enacted through waste – the restoration of order as well as its potential transgression, while always reflecting on the elusive type of connection described as the global. Besides, and crucially, for us (special issue) editors, friction also works as a metaphor to describe and reflect on the collaboration between two modes of thinking that still

misunderstand (and often avoid) each other: a Marxist political economy on the one hand (one may associate it with historical materialism) and science and technology studies on the other hand (which is linked to the so-called new materialisms). In other words, the text in front of you is also a product of friction.

The notion of facing friction helps us find the courage to stay with the trouble, to borrow Haraway's powerful invitation (Haraway 2016), to collaborate despite disagreements and beyond one fixed and common theoretical approach. It helps us to engage with the collective tasks of our times (from climate change, resource allocation, pollution and toxic discourses through to various violent forms of exclusion), while not simultaneously shoving these tasks aside with a narrow framing. The contributions to this special issue also reflect this goal and invite us to learn from a multitude of muddled situations.

3. Contributions to this special issue

This special issue contains five research articles and three special contributions, in the form of a photo essay, a review essay and an interview with Max Liboiron from the Civic Laboratory for Environmental Action Research (CLEAR). They attend to the frictions in normative orders engendered by global connections through the lens of different engaged universals – ranging from state-sponsored drives for modernisation (as in_/formalisation), to ambivalent aspirations for valorisation, representation and recognition, and on to claims for social and environmental justice. The authors address matters of electronic waste, plastic waste, (human) excreta, as well as mixed wastes flowing through landfills and water bodies. While the global character of the connections enacted through the work with waste appears more or less obvious, all the contributions assembled in this issue reveal that frictions through waste are invariably saturated with power relations. They remind us that "encounters across difference can be compromising or empowering" and that "[h]egemony is made as well as unmade with friction" (Tsing 2005: 6).

In *Scrapping 'Irregulars'*, Ivan Schulz attends to global connections at one of the most important sites of the global recycling economy. He focuses

on recent economic policies towards recycling in China and shows how the 'modernisation' of waste collection and recycling is in fact excluding the majority of e-waste recycling actors. Yet, Schulz is careful not to reaffirm stereotypes, which is why he pushes the notion of 'irregulars' instead of aligning to debates about informality.

The informality characterising recycling networks in much of the world also reverberates in Nicolas Schlitz's analysis of plastic recycling economies in Kolkata, India. In his piece *Recycling Economies and the Use-Value of Waste*, he attends to the fractured nature of global economic connections in a post-colonial context. Schlitz draws on the Marxist notion of 'use-value' to unravel waste work in the political economy of recycling as "work of connection" (Tsing 2005: 7).

In *The 'Abolishing' of Manual Scavenging*, Yvan Iyer exposes persisting caste-related inequalities. Manuel scavengers in India (here, Ahmedabad) face severe discrimination. However, these sanitation workers struggle to address their claims because the government denies their existence. Global-connections reverberate in the implementation of particular sanitation technologies (socially informed by caste-based discriminations) and the legislation that is supposed to 'prohibit' manual scavenging.

In *The Double Burden of Environmental Injustice in a Female Waste Pickers Cooperative in Brazil,* Isabella de Carvalho Vallin and Sylmara Lopes Francelino Gonçalves Dias engage with frictions through the spatial articulations of instances of environmental injustice: the confluence of urban segregation with sexual and racial divisions of labour exacerbates risks associated with housing and the workplace. The authors combine the Brazilian version of environmental justice with a Brazilian adaptation of a French materialist feminist (cf. Falquet 2013) notion of "consubstantiality". This combination of engaged universals helps them to attune to intersectional power relations, while their case study also emphasises how frictions may be the reason for new communities to form.

In their article *Waste De_marginalized*, Robert Hafner and Frank Zirkl discuss key dichotomies of informal waste handling and management practices, and critically assess their pertinence in the Global South and North alike. A comparative study of recycling schemes in Argentina, Brazil and Germany helps them to discuss global connections surrounding social constructions of waste, and develop the notion of 'in_formality' instead.

They emphasise the negative effects of such schemes, most importantly by focusing on socioeconomic effects, to then highlight representational questions of visibility and marginality.

Visibility and representations matter also in Kathrin Eitel's photographic essay *Matter in and out of Place*. She engages with the flows of waste along Cambodia's coasts. In so doing, she recasts the 'life' and 'death' of different materials, redrawing boundaries between 'nature' and 'culture', while introducing us to waste workers who take care of the materials washed up on the beach. This functions as a counter weight to the usual media depictions of dirty rivers (and technocratic calls to 'manage' them).

In an interview with Max Liboiron we learn why power is central to matters of waste. Liboiron is the editor of the academic blog *discard studies*, as well as the manager of CLEAR, an environmental action research lab that centres on marine pollution research. Bringing academia and activism together, while developing interventionist approaches, is one of Liboiron's prime goals. Another example of engaged academic work, focused on the global e-waste issue, is to be found in Josh Lepawsky's new book called *Reassembling Rubbish* (MIT press, 2018), which is reviewed by Stefan Laser in the review essay *Who Carries the Weight of Digital Technologies? What is its Weight Anyway?* Like Liboiron, Lepawsky is a key author in the field of Discard Studies. Laser argues in his review that Lepawsky succeeds in providing a novel entry point to approach electronic waste, which includes fresh insights on this timely matter. A geographer by training, Lepawsky also introduces new forms of data that urges us to refrain from the dominant focus on post-consumer waste. It is "discardscapes", rather than consumption patterns, we ought to centre on, he argues.

We hope the contributions assembled in this special issue encourage a more critical and situated understanding of waste-related inequalities and their global connections – both critical of naturalisations *and* open to disturbances of normative orders and one's own beliefs. Part of this endeavour is more interventionist research on frictions and their consequences.

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