**Making space for waste: Fractal re-production of unsustainable environments**

1. **How waste-making produces space**

Human activity generates unwanted substances, materials and things; therefore, it implies spaces where to throw them away. Since the second half of the 20th century, ‘waste began to increase in tonnage, gain in toxicity, and become more heterogeneous’ (Liboiron 2013), giving rise to what has been called the ‘throwaway society’.

Waste-making transforms the space around us, from the paper basket under my desk, to the chimney that directs toxic fumes into the atmosphere[[1]](#footnote-1). The immediate environments of consumption and production hold the visible marks of waste management – the practises and infrastructures that contain, channel, and expel polluting rubbish away from the environments where life is produced. Its less prominent, yet crucial element is the need of space able to absorb the stubborn residue, the noxious effluvia and the insalubrious exhalations of human production and consumption. In the ‘throw-away society’, the ‘away’ needs to be separated from the ‘throwing’.

Making space for waste is a social and political process that mobilises the notion of spatial justice with implications for the sustainability of the environments we inhabit. As the quantity and unruliness of waste increases, dumping space must expand its capacity, resulting in the devaluation, dismissal or neglect of particular places and people. This expansion and intensification of space for waste is a necessary condition for waste production to grow. On one face, the unequal geographies produced by waste pose a question of social justice: is it fair that certain productive processes benefit some regions whilst dumping harmful by-products on others? This question has been addressed by several strands of social environmentalism, concerned with how the disposal of polluting wastes harms some populations to the benefit of others (Allen 2003; Agyeman, Bullard and Evans 2012; Martinez-Alier 2014). On the other face, the spatial impact of waste-making is not simply unjust because its effects are unfair or immoral; clearing space for waste also creates the social and political conditions for unsustainable economies to develop, by allowing the externalisation of environmental harms (Callon 1998; Martinez-Alier 2001; Goldstein 2013; Liboiron 2018b). In this sense, the geographies that waste produces also create the conditions for the production of more waste. So, in addition to questioning the social injustice of waste geographies, a more utilitarian question needs to be asked: How is environmental sustainability at large affected by the devaluation of specific spaces for disposal? By mobilising spatial justice as both a moral and a utilitarian concept, this chapter brings attention to the political conditions necessary for the reproduction of polluting economies, and thus contribute to link local environmental struggles with mitigation of environmental damage.

In order to articulate the notion of spatial Justice (Harvey 1996; Soja 2010), I will discuss literatures on environmental justice (Martʹinez-Alier 2002; Pellow 2002; Gould, Pellow and Schnaiberg 2008; Davies 2014), in conjunction with classical analyses on the social production of space and place (Lefebvre 1996; Soja 1996; Massey 2005; Ingold 2011). The specific contribution of this chapter results from looking at spatial justice through the perspective of waste and border theories (Goldstein 2013; Mezzadra and Neilsen 2013), at different scales: from intimate and urban levels to wider global and extra-terrestrial scales. In the next section I present three types of processes through which spaces are emptied of their social and political value in order to fulfil the economic function of absorbing waste. After that, I briefly reframe classical geo-sociological notions of space and environmental justice through the perspective of discard and border studies. In the last core section, I deploy those conceptual tools to identify and discuss a series of examples related to ‘discard studies’, from intimate domestic spaces to global and more than global scales, of how unequal geographies produced by waste produce the conditions for the reproduction of wastefulness.

1. **How space is produced by waste**

**Imagining empty spaces**

“We have inherited a [geographical] imagination so deeply ingrained that it is often not actively thought. Based on assumptions no longer recognised as such, it is an imagination with the implacable force of the patently obvious. That is the trouble” Doreen Massey, *For Space*

The belief that the leftovers of human activity may disappear requires a particular conception of space. This spatial imagination manifests in the way the sea, the atmosphere and outer space have for long been conceived and treated as infinite dumps. The imaginary character of these conceptions of space has been revealed in recent years through advances in climate, maritime and astronomical sciences. Let’s think firstly about the oceans. For a long time, they seemed able to wash away everything people chucked at them – urban sewage discharges, oil tankers’ residue, solid waste, or the litter of dead rivers. In recent years, gigantic ‘plastic islands’ accumulating at the vortexes of oceanic currents (Eriksen et al. 2014) and the proliferation of microplastics in maritime life (Thompson et al. 2009; Liboiron 2016) have emerged to public consciousness, showing the limits of maritime waste dumping (MARPOL, 2011). The effects of sea pollution have also proved particularly recalcitrant to the efforts to ‘clean it up’ (Liboiron 2015), contributing to the end of the illusion that the vastness of the oceans might dissolve all sorts of waste.

A similar process has been occurring in relation to the Earth’s atmosphere. The carbon molecules released by two hundred years of fossil-based industrial production and transportation have not been melting into air. Rather, ‘[e]very molecule of CO2 above the preindustrial level resides in the atmosphere’ (Malm 2018: p.5) threatening to trigger irreversible effects. Yet, for many years, the atmosphere was treated as an infinite sponge able to absorb the by-products of the combustion of carbon (oil, coal, gas, and plants) extracted from the earth (Malm 2016).

A third such process has occurred in the space beyond the Earth’s atmosphere. The proliferation and accumulation of human-made debris circling the Warth has become a matter of concern for scientists (ESA n.d.; Damjanov 2017; Reno 2018). The apparent dematerialisation of technologies of communication, tracking, surveillance, and sensing on Earth has in fact created an increasing mass of ‘space junk’, now closely tracked by international space agencies[[2]](#footnote-2).

The perception of the sea, air and outer space as infinite containers of wastes has allowed the growth of wasteful economies providing dumping spaces that haven’t even been until recently recognised as such. The same processes have been taking place in inhabited and habitable land, raising issues of social and spatial justice. The next sections will focus on these earthlier processes.

**Political dump creation**

On the surface of the Earth, dumping grounds of economic activity may consist of: municipal landfills, petrochemical waste pits, the land from where tar sands are extracted, or the regions that host polluting industries. They are the ‘away’ of the so-called “throw-away society”. As O’Brien (2007) and Gregson (2007) argue, the ‘throw-away society’ is wrongly used as a sort of libel against the individual behaviour of callous consumers, and not as a critique of the economic mode of production, as Vance Packard (2011 [1960]) has shown. Amongst the processes through which this throwaway society has been constituted is the production of ‘away spaces’, which have to be made distant from the location where the main benefits of the economic activity are mostly enjoyed. They also have to be devalued and their populations disempowered in order to justify their dumping function.

The processes of devaluation and disempowerment can take three different forms. The forst one is the economic dependency from polluting operations. As Hoshchild showed in her ethnography of Tea Party supporters in Louisiana (Hochschild 2016), the very victims of the poisonous operations of petrochemical industries can become the fiercest adversaries of environmental regulation, standing by the economic freedom of local industrial elites. In a region where petrochemical industries became the main employers, contributing to annihilate the alternative economic activities provided by the region’s rich natural resources, the population joins the employers in combating the threat of a regulating state, even when work is hazardous and at times irreversibly disabling for workers and residents (*ibid*). The same process could be observed after the 2016 tragedy of Rio Doce in the state of Minas Gerais, Brazil (Zhouri et al. 2017). In this case, a catastrophic accident, caused by the collapse of a damn that supported the wastes of an iron ore mine, unleashed toxic muds though a series of rivers and subsidiaries, eventually reaching the sea. The destruction of the alternative modes of subsistence in the region has made it more likely that the local population, especially its laid off workers, ended up campaigning alongside the factory owners for its re-opening (ref film). The same is likely to happen in places where fracking starts by breaking the opposition of local populations and ends up imposing itself as the only viable economic activity in a region where alternative economies are destroyed by the predatory effects of its activities (Heslin 2013; Short and Szolucha 2017).

A second way through which spaces for wasting are created is through what I call ‘political emptying’. Writing specifically about sanitary landfills, Josh Reno notes that spaces where waste comes to rest are ‘empty not only because they possess raw air space to fill with trans-local discards, but because they lack the means to resist the pre-emption of local lands for such purposes’ (Reno 2016: p. 147). This notion opens the possibility to understand the spatio-historic processes through which particular populations are devalued. As Ageyman and colleagues put it, “companies usually locate their dirtiest businesses is areas that offer the path of least political resistance’ (2012: p.4). The terms ‘waste colonialism’ (Liboiron 2018b) and ‘toxic colonialism’ express the ways in which wasteful forms of economic production – which include disposability, planned obsolescence, and single use packaging, always assume a hinterland to be used as it were a colonial possession – exploited for ‘settlers goals’ through dispossession or contamination (*ibid*).

Finally, space is pre-empted for disposal through the devaluation of the ‘commons’. A culturally arbitrary (Bourdieu and Passeron 2008) attitude towards shared uses of space naturalises dumping of waste and pollution in oceans, atmosphere, and the ‘orbital commons’ (Damjanov 2017). This understanding of land publicly owned or devoid of property rights as naturally prone to inefficient uses, eventual exhausting, or underexploiting of its resources is at the basis of the influential thesis of the “tragedy of the commons” (Hardin 1968). The association between waste and commons is at the etymological origins of the term waste, meaning “vast, desolate land” (Damjanov 2017). The association between waste and commons is also at the origins of ideological processes of dispossession of local populations and ecologies to make way for modern capitalist uses of the land. The classic views of John Locke on the legitimacy of the British enclosures starting in the 15th century, and Karl Marx’s critique of this process of dispossession are discussed in detail in Jesse Goldstein’s article, ‘Terra Economica’ (Goldstein 2013). Goldstein demonstrates the crucial role of enclosures in producing, through dispossession, the space and labour-power necessary for economies ruled by modern science and capital. Goldstein’s thesis on the production of ‘Terra Economica’ reveals the processes of erasure and devaluation of the many functions that those common lands had had for local communities. The author draws parallels between imperial expansion and these processes of (as it were) internal colonisation, using the Marxian concept of primitive accumulation, or as Harvey calls it, ‘accumulation by dispossession’(Harvey 2005). What Goldstein calls, the “bloody” dimension of primitive accumulation, extending from enclosures through colonialism, the slave trade and into the disciplining of wage labor”, is a process of ‘historical creation of absolute space’ (*ibid*). But there was also, the author defens, a ‘dirty’ side of the process, one in which non-productive land is seen as waste, thys disregarding and displacing many ecological and economic circuits related for example to shared used of land, foraging, gleaning and even animal circulation. Borders, including national borders, are crucial devices in these three forms of producing space for waste out of what is considered wasted space.

**Waste and borders**

By borders, I don’t mean only national borders, but rather the various physical and symbolical ways through which waste needs to be transported and contained beyond certain geographical limits. Mezzadra and Nielsen’s *Border as Method* (2013) is particularly useful here. The authors suggest that borders act as functional devices, not simply meant to stop movement but rather to provide particular types of movement that benefit particular power structures. In particular they argue that globalisation has multiplied borders and its functions rather than contributed to eliminate them. In this sense borders act as ‘membranes’ (Calafate-Faria 2016) in the sense that they are designed to be selectively permeable. In the case of waste, borders need to let through what we ‘throw away’, and keep it away, so that it doesn’t bounce back. They also need to limit visibility, and the movement of information and people. Thus these borders are meant to hide, as much as to contain; they also need to be policed and managed. As Zygmunt Bauman ironically remarked, “waste is the dark, shameful secret of all production. Preferably, it would remain a secret” (Bauman 2004:27). He continues,

“Rubbish collectors are the unsung heroes of modernity. Day in day out they refresh and make salient again the borderline between normality and pathology, health and illness, the desirable and the repulsive, the accepted and the rejected, the comme il faut and comme il faut pas, the inside and the outside of the human universe… All boundaries beget ambivalence, but this one is exceptionally fertile.” (ibid: p.28)

In order to understand how waste produces specific spatial relations it is necessary to engage seriously with Doreen Massey’s exhortation against “the imagination of space as a surface on which we are placed… [and ] the sharp separation of the local space from the space out there’ (Massey 2005). In this sense, rather than representing walls or lines on maps, borders should be thought of as symbolic lines, curtains and selective barriers or membranes. The fence, the earth’s surface, the atmosphere, national borders, urban walls, chimneys, lids of rubbish bins, etc refer to various scales of analysis. Through processes of bordering and hiding spaces of waste disposal and emission from those where value is generated, waste movements produce differential geographies and environments at various scales. This production of unequal geographies raises the question of spatial justice.

1. **How wasteful economies produce spatial injustice**

**Spatial Justice**

I am suggesting here that spatial justice is defined by processes of geographic distribution of value, power, resources and harms. I am working with Lefebvre’s idea that space is produced by, as much as it produces social life. This approach challenges the intuitive notion of space as empty container.

In Against Space, anthropologist Tim Ingold (2011) argues that most disciplines use terms such as ‘environments’, ‘land’, ‘earth’, ‘country’, ‘ground’, and ‘landscape’, but not space, which he considers meaningless. Therefore, Ingold prefers the word *place* – which highlights the material and social elements of geography. Furthermore, places are not, for Ingold, bounded flat portions of the territory, but rather confluences of trajectories, stories, roads, pipes, waterways, movements of people and things that assemble at a particular location in a particular period. A house, a neighbourhood or a city can be seen as places in this way: agglomerations or tangles of crossing lines.

Surprisingly, ‘Against Space’ does not present a counter-argument to Doreen Massey’s ‘For Space’. In fact, they both arrive at *place* as the key-concept to unlock the historical, social, infrastructural, biological, and geological processes that shape particular social environments. The disjunction between Ingold and Massey is merely semantic – Massey proposes that we think of space in terms of places and sometimes uses both terms interchangeably, whereas Ingold thinks we can do away with the word *space* in social sciences all together.

Like Ingold, Massey looks at places as sites of intersections rather than a bounded contained space. A place in this sense counterpoises a material imagination against a bordered notion of space. Both authors think about space and place as geographic entities crossed by lines (in the case of Ingold) and flows (in the case of Massey). What makes places real and relevant is the confluence of those circulations, rather than a sense of temporal and spatial self-containment. My purpose here is to take their work forward by considering how waste is central to place-making, both by creating the need to get rid of it and shaping ‘elsewheres’ for disposal.

**Spaces of negative flows**

Similarly influenced by the work of Henri Lefebvre, Ed Soja also propsoed a socially dense conception of space (Soja 1996b). Soja points to the importance of understanding ‘thirdspaces’, or ‘lived spaces of representation’ (ibid), as the locus of conflicts between sectors of the population and the spaces they inhabit, both within and beyond the imagined borders of place. The notion of heterotopia, which Soja borrows from Lefebvre and Foucault, pushes us beyond the dichotomy between materialist and idealist approaches to bounded spaces. The processes of production of space, and the dynamics of people living in unequal social environments always generates spatial imaginations and possibilities, both emancipatory and threatening to the construction of social justice. They also produce, what Lefebvre calls ‘consequential geographies’ in the sense that they impact other spaces and the construction of possible local futures.

Soja was the first to advance the notion of spatial justice, expanding on the concept of ‘right to the city’ (Lefebvre 2003; Harvey 2008) and the territorialisation of social justice. Soja’s proposal is built upon, on one side, ideas of geographies of difference discussed by theoreticians of uneven development (Smith 2010), who in turn have actualised traditions of dependency theorists from Latin America and world-system scholars (Furtado 1976; Frank 1979; Wallerstein 2004); and, on the other side, on the urbanisation of social justice proposed by David Harvey (Harvey 2010). These two contributions advance a geographic understanding of dynamics of global inequality but tend to look at the politics of spatial justice in a materially autarchic way. What I mean here is that by localising and highlighting the local manifestations of the global contradictions of capital, they tend to neglect the mutual constitution of spaces beyond the economic logic of division of labour and flows of investment. In Justice, Nature and the Geography of Difference, Harvey (1996), departing from a discussion of the Summers Memo controversy and the Love Canal struggle (see below), starts to introduce the issue of waste and externalities in the economic process of producing unequal geographies. His discussion of externality and his critique of the belief in a cooperation between a regulating state and profit-seeking private sector, though useful, overlooks the role of waste in the reproduction of unjust geographies and environmental destruction. To put it in Harvey’s terminology: my aim here is to look at the debris of creative destruction, which is crucial to present processes of primitive accumulation, and to how the demands posed by the continuous production of material with negative value – waste and pollution – involves invisible processes of ‘accumulation by dispossession’.

1. **Fractal geographies of difference**

Space is ‘constituted through interactions, from the immensity of the global to the intimately tiny’ (Massey 2005: p.9). Local, national and global scales are, to a large extent, socially constructed. They are imagined, abstract and ideological entities. The classic work of Benedict Anderson (1991) presented nations as ‘imagined communities’, and in the present rapidly urbanising and metropolising world, cities are increasingly also imagined entities (McNeill 2001; Angelo and Wachsmuth 2015). The idea of the world as one bounded place is also a consequence of recent developments in Earth-system science from the natural sciences (cf. Latour 2017), world-system theories in the social sciences (Wallerstein 2004) and culturally ‘imagined globalisation’ (Canclini 2014). We can add to these imagined spatial unities, intimate spaces such as the home or even the body, which can be seen as entanglements constituted beyond its imagined borders and its conceived purity (Liboiron 2013). Localities, nations, homes, houses and bodies can be more accurately understood in articulation with heterotopic spaces such as extended territories, atmospheres, or socio-material environments. In this section we will look at how spaces are devalued and divided for discarding purposes at four different scales, adopting an expansive fractal sequence, from smaller to wider. I start with the home and will end in the global.

**Between home and beyond**

Italo Calvino’s essay La Poubele Agree, written in Paris between 1974 and 1976, speaks eloquently of the domestic geo-temporalities engendered by waste disposal. The Italian novelist describes in detail his most competent participation in the domestic division of labour: the domestic waste disposal tasks. His kitchen is where waste accumulates before he periodically carries it down to in the garage where it is stored in a bigger container. In the third step of these rhythmical tasks, he places the container out to be collected by the city of Paris. here Calvino reflects on how his ‘functioning as humble cog in the domestic machine’ is ‘already taking a social role’, acting as a link in a ‘chain of operations… without which I would die buried under my own rubbish’ (Calvino p.68). However, one might speculate that, should the municipal collection not be in place, perhaps the consumption habits of Parisian families would have to be less wasteful. In fact, one of the functions of the municipal systems of waste collection is to create the conditions for mass consumption. In any case, Calvino’s sociological imagination helps us think of our private spaces and domestic division of labour as co-produced with wider spaces, real and imagined. In imagining what happens beyond the waste collection outside his house, Calvino muses on the prevalence of immigrants from African origin working in Paris’ waste collection. “in the solid French economy’, he reflects, “refuse collection is a precarious occupation, performed by those who have not yet managed to put down roots in the city” (ibid: p.74). Like David Harvey and other Marxist geographers, Calvino’s critique focuses on the division of labour. But the novelist also suggests that waste-making engenders material connections that have spatial implications between home and wider scales.

The anthropologist Mary Douglas has shown the importance for home-making of the constant expulsion of dirt (defined as matter out of place) and through that effort, proceed to a ritual cleaning that separates inside from outside, that which contributes to the production of life segregated from what threatens the order of things (Douglas 2002; Millar 2018). Yet, what is thrown out of the house because it was ‘matter out of place’ may become dirt somewhere else. And this is increasingly so due to the dramatic changes in the quantity and types of materials produced in the last 50 years or so (Liboiron 2013; 2016).

The relationship between domestic spaces, gender relations and wider economic changes is crucial to the argument of the classic work by Michael Thompson, Rubbish Theory (1978), but here focusing on discarded objects rather than materials. Thompson’s main thesis is as follows: objects can move from a transient category (when value decreases with normal wear and tear) to rubbish (where value is zero) and then, if those objects are left or hidden in a drawer or loft, they may reach the status of ‘durable’, when the object becomes socially recognised as antique or vintage. At this point rather than decreasing, objects’ value only increases with time. Thompson notes that the transference from ‘rubbish-state’ to ‘durable’ usually corresponds to a transference from the care of a woman, who had it preserved in an intimate space, to the sphere of exchange, dominated by men (Thompson 1979:33). Thus, Thompson’s ‘rubbish theory’ shows how the domestic division of space organised by gender relations is an important part of this process. A striking aspect of Thompson’s proposal is that, for all its powerlessness to define values, feminine spaces potentially open up the grounds for a politics of value, both through practices of wasting, discarding, and refusing, but also for reconstitution of systems of value. It is worth noting that for Thompson, the rubbish stage is one filled with potential. Temporarily released from rigid structures of order, rubbish provides rich sociological terrain for politics of value. The passage through rubbish status opens up the space for rigid systems of knowledge and value to be reconfigured in their functioning as “structures of control over time and space” (Thompson 1978: 52).

This picture of gender and domestic spatial relations engendered by waste and waste-making takes a more nuanced aspect in Nicky Gregson’s ethnographic study on ridding, accommodation and dwelling in a Durham neighbourhood (Gregson 2007). This study shows how domestic relations and spatial arrangements are determined by material culture as the efforts to accommodate things results in conflict, negotiation, and common efforts to decide what to keep and what to divest. The author speaks about ridding as ‘acts of love and care’ contesting the thesis of the ‘throwaway society’, in which individual reckless behaviour vis a vis material culture in the main drive for wasteful consumerism. This ethnography also concentrates on charity shops and other in-between nodes in the circulation of divested objects, revealing the emotional and physical efforts involved in getting rid of things. Gregson shows how waste is often the main reason that lead people to relate to their streets. In lives marked by commuting and long-distance communication, having to discard a large object or to hand down an unwanted appliance or a bag of old clothes, generate actions (often solely) responsible for creating a sense of place and meaningful neighbouring relations.

The connection between home, street, and locality through waste is geographically contingent and has changed throughout history. In ‘History of Shit’, Dominique Laporte traces the beginnings of the city of Paris’ concerns with urban cleanliness. The author describes the way sanitary exchanges between home and its environments were initially not mediated by infrastructure. People used to get rid of faeces and urine produced in the house by throwing the contents of their pots out of the window. He suggests that these practices are at the origins of the word *loo,* which in England is used to name the toilet. The person (usually a woman) getting rid of the smelly excretions of the house would shout to passers-by, “gardez l’eau!” (mind the water), which evolved to the word *loo*. This story helps Laporte communicate the historical evolution of the understanding of space beyond the domestic organised by waste management practices. As he shows, the attitude of “cleaning up in front of one’s house; heaping against the wall’ defined a space very different from the one suggested by Calvino’s awareness, a hundred years later, that his life depends on the removal by the municipality of the daily discards of his family activity.

Today, there is a growing interest in what happens beyond that exchange with the rubbish collector. In London, we are increasingly familiar with the nitty-gritty of municipal recycling: the tail-chasing arrows that comprise its logo, the two or more colour-coded bins, the plastic boxes or green bags, the instructions about what goes in which container, and the days when the truck comes to collect materials, leaving a trail of empty wheelie bins in disarray along the sidewalk, or half-emptied boxes by driveways and front gardens. Some of us are even increasingly curious about where it all goes. Yet the spectacle of ecological right-doing seems to draw a green curtain over what happens beyond the bend that the recycling and the general rubbish truck take, when they carry our discards away. As urban dwellers we tend to recognise the moment of waste collection as one in which our mundane practices integrate with wider scales of spatial politics. Yet the spatial politics engendered by waste making and the ways in which they hinge on the reproduction of the wasteful economies that shape our lives tend to be kept mostly hidden from our view. In the next section I will focus on the role of rubbish and waste-making in producing divided spaces in the city.

***‘The City and the City’***

“'Rain and woodsmoke live in both cities', the proverb has it. In Ulqoma they have the same saw, but the subject is ‘fog’. You may occasionally hear it of other weather conditions, or even rubbish, sewage, and, spoken by the daring, pigeons or wolves” China Miéville, The city and the city

China Mieville’s fantastic novel about two cities that share the same urban space at the same time, and whose residents speak different languages and are not allowed to interact or even acknowledge each other, contain many metaphors for real urban conviviality today. It also contains various references to the uncertain place of waste in the precarious spatial arrangements of the two cities. Ulqoma and Beszel, the fictional city-states in Mieville’s story, occupy different areas of the map, but they are also bordered by large intersections of *crosshatched areas,* in which both cities coexist. In these spaces of precarious cohabitation, a piece of rubbish discarded from either city, “lying across crosshatched pavement or gusted into an alter area from where it was dropped, it starts as *protub*”. *Protub* is the word the author gives to the phenomena of transgression or invasion of some objects or sensations from one city into the other. Yet the invasive qualities of rubbish are only temporary, as

“after a long enough time for it to fade and the Ilitian or Besz script to be obscured by filth and bleached by light, and when it coagulates with other rubbish, including rubbish from the other city, it's just rubbish, and it drifts across borders, like fog, rain and smoke)” (*ibid*)

Like the two fictional cities of Mieville’s novel, waste infrastructures are ideally organised so as to avoid contact with the city which supply them. As Zapata de Campos notes, “cities hide and lock away those infrastructures of waste management in order to make apparent the ‘utopia of the well‐functioning city’ (2013, p. 55). The author uses the term ‘heterotopia’ to categorise those urban waste infrastructures such as depots, landfills, and material recycling facilities, highlighting their role as a mirror or negative image of society. As such they also offer the possibility to better understand the visible city they reflect (ibid: p. 47). As such, it is important to understand ‘how efficient heterotopias contribute to hide the consequences of the consumption and discard society’ (ibid.). For the author, the challenge of sustainable urban governance is to re‐establish, ‘the cognitive links between production, consumption and waste … transforming these heterotopic places into transparent and unlocked containers of our outcasts’ (p. 56).

Often urban infrastructures are located in another city of the metropolitan area accentuating the divide between the populations who produce the waste from those who live alongside the spaces where this waste is stored. For example, as Kathleen Millar writes in her ethnography of waste-pickers of Jardim Gramacho, in the city of Duque de Caxias, around 90% of the 70 million tons of garbage dumped there since 1978 came from the city of Rio de Janeiro (Millar 2018: p. 18). The anthropologist eloquently shows that, ‘though nearly every banana peel, soiled napkin, or plastic wrapping thrown out in Rio de Janeiro eventually ended up in Duke de Caxias, few cariocas (residents of Rio) ever venture into this part of the city' (ibid pp. 18-19). Yet in moments of crisis, the geographical politics that emerge from the entanglements between the two cities may become more apparent, as can be seen in the following story narrated by Millar:

‘During a spat between the mayor of Caxias and the mayor of Rio, over maintenance of the access to the road to the dump, **the mayor of Caxias shut down the road by bulldozing a trench across it**. No trucks could pass, and Rio's garbage was left uncollected on the streets for several days. Outraged, one resident of Rio wrote the following in a letter to the editor in Rio's main newspaper, O Globo: "the mayor of Duque de Caxias does not want Rio de Janeiro's garbage deposited within his city. Now, imagine if the mayor of Rio prevented Rio's municipal hospitals from receiving residents of Duque de Caxias?" **The observation that Caxias is home to the city's dump whereas Rio is home to the city's best hospitals, received no comment**.” (ibid p.19)

The unreflexive outrage expressed by the Rio resident results from a typical characteristic of urban infrastructures: they only come to mind when they malfunction. This is particular true to waste infrastructures and to the spaces where they operate. It also illustrates an awareness to the consequences of the spatial distribution of urban facilities.

**Discarding within and across national borders**

The perception and politics of waste dynamics and movements is further complicated at national scales. Less-developed nations’ right to economic development is often defended against the global imposition of environmental regulations emerging from international agreements. This is particularly salient in current disputes between the first largest national economy - the United States of America and the second and fastest growing one – the People’s Republic of China. In terms of national data, China has surpassed the US as the largest emitter of polluting gases, in particular CO2 (although not yet in units per capita[[3]](#footnote-3)). However, when we take the accumulated figures of the last four decades the US still leads the table. Throughout the first decades of the 21st century, international waste trade has been an increasingly prominent constitutive feature of global inequality. Yet the ‘methodological nationalism’ inherent to the naturalisation of nation-states as units of measurement obscures the spatially unjust dynamics within national territories. As was already mentioned in the beginning of this chapter, those unequal geographies within national territories are particularly well-researched in the case of the US, from where the literatures on environmental justice and environmental racism emerged.

One historical environmental conflict in particular is at the foundation of the environmental justice movement. Forty years ago, Love Canal, a community in the town of Niagara Falls, NY state, saw the eruption into the national and international media of a local struggle against the silent poisoning of its population (US EPA n.d.; Love Canal - Public Health Time Bomb n.d.; Depalma 2004; Blum 2008). An unusually high incidence, in this community of around 100 families, of serious and chronic illnesses, including birth-defects and infant disease, appeared to be caused by the toxic waste that had been deposited underground and had started to emerge in public waters and domestic basements. The history of the land where this community had been set up during the 1950s and 1960s contained the explanation for the unfolding tragedy. Between 1937 and 1952 this abandoned canal had been filled, first with urban waste from the city of Niagara Falls, and then with the poisonous by-products of a local chemical company (Blum 2008: p.22). Once the hazardous waste was ‘covered up, both literally and metaphorically’ (*ibid: p.10*), a school, built at the top of the deactivated dumping site, started receiving children in 1955. A community grew composed of workers from the nearby chemical plants grew quickly around the school. With the first seasonal rainfalls in Love Canal, slur and oily substances rose into neighbour basements, strange substances and containers started floating on water ponds, and metal barrels emerged from the ground. The publicization of the links between the surge in serious health problems and the pollution historically deposited underground gave impetus to a high-profile public campaign, and to various lawsuits that led to the intervention of the federal government, including president Jimmy Carter. The movement culminated in the relocation of the families living in the first ring around the former dumping site in 1978 and then of the rest of the local community in 1980 (Omang 1980). The relocation of the 97 families residing in Love canal marked the start of a 21 year-long cleaning-up process and the establishment of the Love Canal campaign as a founding moment in the literature and activist movement on Environmental Justice (Harvey 1996, p.369; Reno 2016, p.23).

Love Canal was treated as empty space, both when it became a dump and when it was covered up to serve as ground for a new working-class neighbourhood. Inversely, many studies under the environmental justice (or environmental racism – see Martinez-Alier 2001) label, have denounced the preferential location of polluting infrastructures and waste facilities in places already inhabited by disadvantaged populations. A recent example of this is the widely reported conflict around the North Dakota pipeline, projected to carry fossil fuels from Canada through native American Land (e.g. Whyte 2017). What permeates through most of these studies is the account of vulnerable populations struggling to protect their health and livelihoods from harms generated in the process of producing value enjoyed by populations elsewhere (Martinez-Alier 2002). Through these accounts one can discern the formation of unjust geographies. For example, there is now a body of solid research on how ‘North American consumers benefit from the myriad products made possible by petrochemistry, while pollution and waste often affect only the poorest communities’ (Misrach and Orff 2014, p.129). Consumption landscapes demand heavy industrial and circulation processes, whose toxic effects ‘are relegated to far corners of the country as factory farms and waste pits’ (ibid, p.47). As the populations of these ‘corners of the country’ know, or end up finding out, waste tends to not be easily kept at bay. In the USA and elsewhere, sanitary landfills leach into the ground (Reno 2016; Millar 2018), underground waste pockets seep into ground water reserves (Misrach and Orff 2014), storage ponds overflow, and iron ore waste dams may collapse, breaking the frail line between mines and rivers (cf. Zhouri et al. 2017). Unwanted substances tend to be recalcitrant to containment, and waste inevitably ‘bites back’ (Bennett 2009), as it did in the case of Love Canal.

In this context national borders often appear as a sort of symbolic container of pollution to be policed. In his ethnography of a sanitary landfill in Michigan, Joshua Reno argues that the Environmental Justice Movement has demonstrated ‘since the Love Canal disaster, (…) [that] landfilling does not eliminate environmental and health risks entirely, but concentrate them elsewhere’. (2016: p.23) The lack of political and economic power of the populations who are affected by the toxicity of these wastes is a necessary condition for this spatial arrangement. In Reno’s ethnography the issue that commanded stronger political resistance from those working and living in the proximity of the landfill was the intake of waste from Canada. Trans-border waste carried a form of symbolic toxicity that mobilises popular resistance in ways that waste from much more distant American states did not, even though they were equally responsible for the environmental risks and damage experienced by the local community.

**Global geographies of waste**

Nationalist ideologies currently on the rise are articulated through appeals to contain national territories from different forms of transnational dynamics. This happens at a time when the global imagination reaches a new peak with the scientific and political debates around global warming, climate change and the need to forge global agreements to mitigate and adapt to their consequences. Not surprisingly, the representation of those ‘anti-globalist’ views in national governments in the USA and Brazil have resulted in official rejection of scientific evidence on climate change as well as in the withdrawal of those countries from international agreements established to reverse its effects. These national and inter-national political debates tend to obscure the long-term transnational flows of waste and how they shape global relations and space.

The international trade of waste is an important phenomenon of today’s global political economy. We know for example that in 2012, the largest export of the richest national economy of the world (USA) to the upcoming second largest economy (China) was scrap (Reno and Alexander 2012). More recently, it has been reported that the Chinese government decided to stop importing waste (Reed et al 2018), causing much uncertainty to the future of recycling arrangements in many countries. This trade developed in the last decades, in parallel with the rise of urban recycling, and increase in domestic and commercial waste production. It was also associated with the voluminous exports of manufactured products from China. The container ships that carried those products out were filled with various types of waste for recycling on return. The question now is what space needs to be ‘emptied’ to fill this void created by the levelling of the Chinese economy? Will it be the atmosphere already saturated with carbon to take the burden through increase in incineration activity? Or will another developing country take on the demand for this offer? Or will a more just understanding of unequal geographies, force everyone to inflect the growth in the consumption of plastic-based objects.

For the last 30 years, the international waste trade has been to a large extent a continuation of the principles expressed in the infamous ‘Summers memo’ (Harvey 1996; Foster 2002; Reno 2016). Written by Larry Summers, then chief economist of the World Bank, in 1991 this leaked memo expressed the economic logic behind the migration of polluting industries to less developed countries on the basis that they were ‘under-polluted’. This case made visible a debate in which economic reasoning justifies ‘toxic colonialism’, ‘toxic imperialism’ (Harvey 1996), or what Liboiron called ‘waste colonialism’ (Liboiron 2018). The transferences of waste from affluent countries and cities to undeveloped areas has been a fact regardless of whether it is justified or not by economic logics. These transferences have allowed global emissions of pollution to rise even though polluting substances and materials may shift around the world. Indeed, and this is the main point of this paper it is this ability to conquer space for waste that produces the conditions for that global increase in pollution. Shifting responsibility with this movements only contributes to the lack of solution. As Eckersley remarks, ‘the structural injustice of climate change’ happens ‘in the context of the more general unequal flows of energy, resources and materials between North and South’. This injustice is concomitant with ‘the colonial legacy and the shifting division of labour in an increasingly integrated economy’ (2016).

Attention to global flows of waste through inter-national and trans-national trade, and to the mechanisms through which they shape global space reproducing colonial and post-colonial dynamics allows us to look at a different way to the current discussions on responsibility for environmental damage. It is not a matter here of establishing a rank between polluting countries and defining how to level their polluting allowances but rather to understand how spatial injustice creates the conditions for the reproducing of environmental damage. Looking at the circulation of materials and including waste and waste colonialism in the analyses shows that the dislocation of certain activities and materials to developing regions may increase their contribution to global pollution but not necessarily their responsibility. Eckersley's (2016) application to Climate Change of Iris Marion Young’s forward-looking model of responsibility for structural injustice is particularly useful here. Opposing the liability model that tends to look backwards in time in order to find individual culprits, the authors propose a forward-looking model that associates responsibility with an understanding of structural injustices that can be collectively tackled. Eckersley’s contribution to the discussion of notions of climate debt and polluter pay principles, which tend to be associated with a liability model, is particularly illuminating. If we see cumulative harms (such as the aforementioned difference between the present and the cumulative rankings of emissions) not as individual blame but as a benefit that needs to be shared and apply Young’s forward-looking model of shared responsibility, a new frame for international cooperation for a better environment may be opened. The construction of global spatial justice could rise from that new frame.

1. **Spatial Justice for sustainability**

There is plenty of evidence that many parts of the Global South have been treated by Global North countries and transnational operators as dumping grounds for the production of economic value that is consumed elsewhere. It is not only that countries and cities of the Global South organise and disorganise themselves for the production of consumer goods consumed in the Global North and the subsequent destruction of the *bads* they generate. Yes, waste moves from richer to poorer countries, and manufactured goods travel in the opposite direction. It is true that we have seen a dislocation of polluting industries, which supply richer cities, to areas of the Global South, which expand around these activities. It is also true that the wastes of short lifespan products consumed in rich cities, such as water bottles and smart phones, are also shipped to those poorer areas of the world. But inside the countries and cities of both North and South, smaller scale geographies of difference mirror and reproduce the dynamics of higher scales. Take for example the so called ‘cancer Alley’ in the US American state of Louisiana, where high levels of pollution and potential damage hang over their populations, who don’t reap the benefits of the wealth they generate, as other parts of the country do (Misrach and Orff 2014, 47). Or, if we look at the urban scale, we can see that ‘waste infrastructures and spaces are hidden in poorer parts, becoming heteroropic spaces that make possible the utopia of the well-functioning city’ (Campos, Zapata and Hall 2013: p.47). In all of these cases, the production of dumping spaces for wasteful economies involves devaluation and political disempowerment of present and future residents of those spaces. We can continue to contract the scale and look at how private spaces relate with and are divided from the urban infrastructures and at how domestic spaces and familial relations are themselves constituted and divided by waste circulation and disposal practices.

At all these scales we can see processes of dealing with waste that rely on bounding and assigning spaces that can separate waste from the production of value. These negative spaces play the same function as oceans, atmospheres and the outer space have played in the magical disappearance of waste in rhythmical articulation with economic and social activity. These spatial processes allow waste-making to expand.

The need for environmental sustainability thus poses, not a choice between individual and structural change based on individual or diffuse responsibility. Rather, it forces us to understand the articulation between the various scales at which spatial dynamics create the conditions for the expansion of disposable economies. If Walter Benjamin’s Angelus Novus was facing the past and contemplating the accumulated debris of progress, we must now look at our contemporary neighbours near and far, who suffer the consequences of that accumulation of waste. They are not in the past but rather in the places constructed by the present expanding disposable economies. A new understanding of spatial justice is a condition not only for a fairer world, but also for a more sustainable one.

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1. ‘In Germany in the mid-19th century, there was a so-called “chimney war”. Complaints against pollution of sulfur dioxide led to building taller and taller chimneys. Chimneys of up to 140m were built already before 1890. The authorities ordered the tall chimneys to be built in order to pacify protests in the immediate surroundings. The factory owners complied willingly in order to disperse the pollution over a larger territory where hopefully it would be mixed up with the pollution from other factories, thus evading responsibility in judicial cases which required cause-and-effect proof of the source of the damage. Discussions on the effects of sulfur dioxide not on people’s health but on the forests are also over 100 years old. Momentarily, the chimneys solved the conflict if not the problem.’ (Martinez-Alier 2001) [↑](#footnote-ref-1)
2. Such as the North American Space Agency, United Nations, European Space agency [↑](#footnote-ref-2)
3. Source: European Union [↑](#footnote-ref-3)