

The background image shows a vast industrial waste management facility. A massive, multi-colored pile of garbage, including plastic, paper, and other debris, dominates the foreground and middle ground. To the left, a concrete wall is partially covered with hanging plastic waste. In the background, a large crane with a grapple is visible, positioned over the waste pile. The facility's structure consists of high concrete walls and a complex network of steel beams and walkways. The overall atmosphere is one of overwhelming scale and industrial activity.

OXFORD

WASTE AS A CRITIQUE

edited by **HERVÉ CORVELLEC**

Waste as a Critique

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Hervé Corvellec

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And he freely admits that as a father, husband, son, friend, colleague, and concerned citizen, he is sometimes simply too interested in waste.

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Introduction

Towards a Critical Waste-Based Epistemology

Hervé Corvellec and David Bevan

Aim of This Book

During an era overwhelmed by an unparalleled capacity to produce waste, coinciding with an incapacity to manage it, various fields, from the arts (Boetzkes 2019), architecture (Bahamón and Sanjinés 2010), design (Treggiden 2020), and, without limitation, to the circular economy (European Commission 2021) have come to emphasize the need and the possibility for engaging with waste to meet the challenges of the Anthropocene. Drawing on related interdisciplinary interests for waste, this volume presents contributions that address the thematic concerns of materiality, society, economy, and temporality to showcase the potential for waste as an epistemological lens through which the social world may be critically examined and reassessed. The aim is to offer an introduction to critical waste-based epistemology.

The sheer volume of waste production already presents itself as a clear and devastating challenge to the current organizing of a world which:

generates 2.01 billion tonnes of municipal solid waste annually, with at least 33 percent of that—extremely conservatively—not managed in an environmentally safe manner. Worldwide, waste generated per person per day averages 0.74 kilogram but ranges widely, from 0.11 to 4.54 kilograms. Though they only account for 16 percent of the world's population, high-income countries generate about 34 percent, or 683 million tonnes, of the world's waste. (The World Bank 2018, 3)

Beyond any significant differences that reflect the global inequalities in wealth, billions of people on Earth share the already unsustainable practice of producing around a half ton of household waste annually. This waste is dwarfed by other types of waste. Eurostat (2022) reports that the quantity of

construction and demolition waste is four times that of households. Meanwhile waste from mining and quarrying exceeds that by more than double; and waste from manufacturing, energy, and other economic activities by twice again. Together, industrial and commercial waste are more than eight times greater than the household waste that everybody can see. To these quantities, emissions of CO₂ and other gasses must be added, together with the pollution resulting from production and leakages caused by the consumption of goods (such as tire-wear particles), and waste that is dumped in developing countries as ‘used items’. Waste production is a natural byproduct of life; however, it has become a colossal, ubiquitous issue. The Earth is being transformed into a global bin, subsumed in plastic waste from mountain peak to ocean floor. Waste has developed into an apparent and existential threat for all life forms on Earth.

The fields of engineering and the physical sciences quickly recognized the waste crisis as a pressing challenge that needs addressing. Researchers have made efforts to find solutions and suggested pragmatic approaches to tackle it. For example, journals like *Waste Management* (Elsevier) and *Waste Management & Research* (SAGE) publish fundamental and applied research about how to enhance waste characterization, collection, separation, treatment, disposal, and recycling techniques, and also how to improve industrial production efficiency, reduce food waste, promote reuse, introduce extended producers’ responsibility, or prohibit specific items. This knowledge is effectively retransmitted through trade publications to the waste and recycling industry to inform and improve their practices.

By contrast, traditional management and economics pay scant attention to waste. Neo-classical economics, nested in St Thomas Aquinas’s (1947) separationist interpolations of the Christian Bible, accepts that man has dominion over all external things (environment, animals) that are not natural to man. On this basis, a millennial tradition of the seasonally circular economy of farming, in which little if not nothing was discarded, was superseded in the nineteenth century by a finite, linear model of extraction, production, distribution with consumption as its end. This intensive exploitation of materials generated capital at a comparatively exponential rate, and—setting aside denial—at least two positions appeared to counter any possible objection. The first of these is a robust repudiation as exemplified in these words from J. D. Rockefeller addressing the Commencement at Brown University over a century ago:

We ought not lament as evil the wreckage that accrues around a business. The growth of a large business is merely a survival of the fittest ... / ... The American Beauty Rose can be produced in the splendor and fragrance which bring cheer to its beholder only by sacrificing the early buds which grow up around it. This is not an evil tendency in business. It is merely the working-out of a law of nature and a law of God. (Tarbell (1905) cited in Altman and Kingson (2015, 91)

In addition to this paternalistic reassurance, a second approach was developed via the notion of externality. An externality depicts a neighbourhood effect, or a spillover that affects non-interested parties. This palliative language may appear careless to the interests of a more contemporary spectrum of stakeholders.

Following the First World War, Arthur Pigou (a Cambridge economist) avoiding the term externality, applies the more tangible if poetic phrasing in the ‘wasteful exploitation of Nature’s gifts’ (2013, 28), and proposes a tax on the marginal damage occasioned by industrial processes: for example, the soot in smoke from industrial chimneys. His efforts appear to have had little effect on the progress of toxic waste disposal into the public sphere, but they contribute to waste being framed as a calculative matter of benefits versus costs. For example, a view of waste as cost has evolved since the mid-twentieth century as the key principle of lean management, in which activities that do not contribute to delivering value to customers are systematically cut to eliminate waste (Womack and Jones 1996).

A narrow techno-economic approach to waste presents itself as something of an epistemological obstacle (see Bachelard 1984) in that it refuses to set the production of waste in the larger social contexts of extraction, production, consumption, and disposal (Liboiron and Lepawsky 2022). This oversight serves to perpetuate the corporate licence to generate profits from long-established, waste-intensive practices: the externalizing of costs of emissions and pollution; the deliberate production of short-lived consumer goods; and volume-driven waste management strategies. The continuing regularity and legitimacy of such arrangements are challenged by each contribution to this collection.

An antidote for attempts to separate or distinguish waste from its social contexts of wasting is realized in the practice of critique. This means of challenging an outmoded established rationale was developed in the work of Michel Foucault, whose method of critique is dynamic and always in the emergent now. Critique

4 Waste as a Critique

keeps taking shape, being extended and reborn on the outer limits of philosophy, very close to it, up against it, at its expense, in the direction of a future philosophy and in lieu, perhaps, of all possible philosophy. (Foucault 2007, 42)

Critique also:

only exists in relation to something other than itself: it is an instrument, a means for a future or a truth that it will not know nor happen to be, it oversees a domain it would want to police and is unable to regulate. All this means that it is a function which is subordinated in relation to what philosophy, science, politics, ethics, law, literature, etc., positively constitute. (Foucault 2007, 42).

It is this dynamic that the contributions to this volume apply to illustrate the potential of waste to serve as a ground and a vector for critical epistemology.

Compared with engineering, the natural sciences, and economic, the social sciences and the humanities approach waste as part of ‘wider systems, structures and cultures of waste and wasting’ (Liboiron 2018, 1). Subverting a techno-economic understanding of waste, they propose an alternate understanding of waste as arising as a consequence of the current modes of extraction, production, distribution, consumption, and disposal, with the imaginaries, regimes of valuation, and routines, attached to them. For instance, Zsuzsa Gille’s (2007) introduction of the notion of waste regime derives from a sociocultural historic analysis of waste politics in social and post-socialist Hungary, reframes waste as a social category that extends beyond the material and technical into symbolic, institutional, political, and cultural realms essential to society. Waste is not an unintended consequence of production, and as Kate O’Neill puts it:

Studying the production, management, disposal, and reuse of wastes tells us not only about wastes themselves, but also about the political, social, and economic contexts in which they are embedded. (O’Neill 2019, 23)

Discard Studies (e.g., Liboiron and Lepawsky 2022), Waste Studies (e.g., Gille and Lepawsky 2022), and humanist studies on waste (e.g., Morrison 2015; Siniawer 2018), all agree that waste can be used as a tool to identify key issues of the society in which it occurs.

A comprehensive review of the contributions to critique from the social sciences and the humanities is beyond the scope of this introduction, but a few necessarily arbitrary examples will provide some context. Acknowledged as a pioneer in economic sociology Torsten Veblen (1994) elaborated a critical treatise on waste as a wasteful concomitant of consumption,

and, in a similar spirit, Georges Bataille (1988) demonstrated how waste contributes to developing social links. Without referring to these, but with exceptional insight, Vance Packard (1960) then condemns industry for adopting planned obsolescence to drive consumerism and fuel waste production. Garrett Hardin's (1968) historic account of our resource-constrained world, prefigures images of the commons in frontier conditions as a polluted cesspool, which unmanaged, only expands as populations grow. From his work originating in the late seventies, psychoanalyst Dominique Laporte (2000) describes how sanitation practices aimed at regulating faeces can influence individual subjectivity and regulate the social body. In an early effort to articulate a theory of waste, Michael Thompson (1979) links the production of waste to that of value, emphasizing the idea that this value is not fixed, but changes over time. With impressive methodological inventiveness, waste archaeologists William Rathje and Cullen Murphy (2001) explore the intimate entanglements of what people discard with their daily practices and ideals, via landfill excavations. Meanwhile, via case studies of plastic bottles for water, Gay Hawkins et al. (2015) examine the entanglements of waste production with technical characteristics of material, corporate calculations and marketing strategies, consumption ideals, geographical conditions, global flows, infrastructures development or the lack thereof, risk, protests, regulations, sustainability, and trade. Susan Strasser (1999) shows the social history of waste goes back at least to the Industrial Revolution. Polish sociologist Zigmunt Bauman, having established how bureaucratic arrangements effectively atomize any possible institutional responsibility (1993), then reveals how these arrangements organize the techniques used to manage garbage and extend to the control of refugees and social outcasts: the same culture of excess, 'use-by-date' production, and redundancy, together with the indebtedness, shame, and fear that characterize a culture of waste in liquid modernity (2004). Samantha MacBride (2011) criticizes the individualization of responsibility and related reliance on recycling in solid waste policies and practice, and instead calls for an 'ecological citizenship' that echoes Hawkins' (2006) invitation to ethically acknowledge the corporeality, she calls it thingliness, of things, bodies, and life. Rob Hengeveld (2012) argues that current levels of consumption, energy use, and waste generation are consequences of human species domination. From a cultural and geographical perspective, Nicky Gregson (2023) details the social and spatial discrimination that derive from the global flows of waste and resource recovery, alongside the resistance that emerges among those living in and of these flows. Waste histories allow François Jarrige and Thomas Le Roux (2020) to demonstrate the systematic and thus political dimension of the degradation

of the environment caused by industrial pollution, which is for Max Liboiron (2021) a form of colonialism.

From the social sciences and the humanities, waste research (e.g., Gille and Lepawsky 2022; Kinnaman and Takeuchi 2014) scrutinizes what has been discarded, rejected, and abandoned. In so doing, it interpolates modes of valuation, corporate behaviours, as well as insights on the political choices that make possible the methodical and conspicuous discarding patterns of behaviour that prevail in contemporary societies. Waste as scats (Corvellec 2019; Reno 2014) discloses traces for those with a trained eye to read. In particular, the production of waste is presented as a structural process: deliberate, organized, and normalized (Svingstedt et al. 2020). Waste is not a defect, as claimed by lean thinking (Womack and Jones 1996), that requires correction for its optimal efficiency and quality. Rather, an elaborate production of waste is a constitutive dimensional norm of modern societies. Economic wealth relies on and disposes intensive material and energy throughputs (Daly and Farley 2004), which inevitably result in high volumes of waste. Waste may well be routinely excluded from political promises of growth, technical imaginaries of efficiency, or social ideals of homogeneity; but there is nothing material, nothing symbolic whose production does not result in waste. Consumption and waste production are in the harness of an inseparable structural relation. If there is wealth, there is waste: even if those who enjoy this wealth may not acknowledge it, and as the practice of climate change denial exemplifies (see Norgaard 2011).

The contributions collected here consistently demonstrate that waste presents an undeniable, critical reflection on social organization. Waste itself, and those who work with it, may suffer from social stigma. As a research subject however, waste offers an advantageous platform for critical social inquiry.

Accordingly, the volume intends to show that the multiple facets of waste and disposal behaviours can serve to challenge the unquestioned assumptions, inconsistencies, and unanticipated consequences in both societal practices and theory that appear to have convened uninterrupted in the wake of a global habituation to waste. Building on an increasing capacity within the humanities and the social sciences to set waste in cultural, symbolic, historical, spatial, political, and other contexts, the chapters in this volume raise questions about: anthropocentrism, disposability, economic growth, efficacy, environmental justice, matters of concern, racism, ownership, stigma, social innovation, and techno-utopianism, among other topics.

They demonstrate the potential for waste in grounding *social critiques*; equally, one could say *critiques of the social*.

What Is Critique?

With the *Critique of Pure Reason*, the *Critique of Practical Reason*, and the *Critique of the Power of Judgment*, Immanuel Kant inscribed critique on the heart of philosophy and therefrom into the whole body of the social sciences and the humanities. He considered his age as the age of critique to which everything must be subjected (Kant 2021, Preface A.ix footnote). Putting metaphysics, ethics, aesthetics, along with legislation and science to the test, Kant developed critique as an exercise of logical deduction. In contradistinction to the view that criticism must be observed and conducted from outside (Willette 2010), Kant worked as though from the inside of his concepts, to rationalize and unveil an architectonic structure that might meet the logical standards established in Isaac Newton's *Principia* (2021). Such structuralism could today be seen as restrictive and distorting, but Kant developed critique into a systematic effort, employing reason to develop 'an acute judging of the foundation of all assertions to which we have been brought by the experiences of many years' (Guyer et al. 2005, 272).

Kant's view of critique as a questioning of the foundations of knowledge derives from his understanding of Enlightenment (*Aufklärung*) as 'man's release from his self-incurred tutelage' (Kant 2007, 29): in other words, an emancipation from a state of student-like immaturity, by means of reason, to an autonomy of thinking (Theis 2012). For Foucault, this suggests that Kant 'sets forth critique's primordial responsibility, to know knowledge' (2007, 50). However, Kant's critical system is constrained by a number of idealistic limitations by the standards of a twenty-first-century reader: his structurally theocentric orientation; his assertion that human knowledge can only be understood if we hypothesize the activities of the knower; his claim that all knowledge is illusory; and his contention that his philosophical system is universally complete. Foucault summarizes Kantian critique with the question 'do you know up to what point you can know?' (Foucault 2007, 49).

Explicitly connecting knowledge with power, Foucault refocuses critique away from Kant's interest in the mere production of knowledge to a practice of how to govern or, to put it more clearly, the practice of power. He considers

the core of critique to be developed from a bundle of relationships of power, truth, and the subject. Foucault proposes a redefinition of critique as ‘the art of not being governed quite so much’ (Foucault 2007, 45). And he continues:

I will say that critique is the movement by which the subject gives himself the right to question truth on its effect of power and question power on its discourses of truth. (...) Critique would essentially insure the desubjugation of the subject in the context of what we could call, in a word, the politics of truth. (Foucault 2007, 47)

These words should not be read as though critique might be a simple project of individual liberation. When providing evidence of the successful objects of critique in the Kantian tradition, Foucault lists the critique of positivism, objectivism, rationalization, and technicalization undertaken from the Hegelian Left to the Frankfurt School. For Foucault:

A critique does not consist in saying that things are not good as they are. It consists in seeing what kind of self-evidence [*évidences*], liberties acquired and non-reflective modes of thoughts, the practice we accept rest on. (Foucault 1982, 33)

Critique is an attitude or process of continuously stretching one’s thinking. It is an exploratory way of orienting thought away from accepted regimes of truth, away from metanarratives and what is taken for granted, and towards alternatives and changes in practices of truth making (veridiction). Critique is a gaze that is always heteronomous to its object. It is not a normative end point that imposes its conclusions on practices of truth and forecloses future critique.

Judith Butler (2002) stresses the importance of this non-normativity for critique. She reminds us that for Foucault,

critique is a means for a future or a truth that it will not know nor happen to be, it oversees a domain it would not want to police and is unable to regulate. (Foucault 2007, 42)

Consequently, she casts Foucauldian critique as political virtue: a resistance to authority, an exposition of illegitimacy, and eventually a practice of freedom. From Kant to Foucault and Butler, the question ‘What is critique?’ directs epistemology, via ethics, towards politics. As Myriam Revault d’Allonnes (2022) notes: ‘the critical attitude requires conditions: the rigor of the information, the effective possibility of the debate, the confrontation of divergent opinions, the concern of the plurality’—as here we shall apply to the politics of waste.

Presentation of the Chapters

The chapters in this volume elaborate a novel, critical waste-based epistemology that addresses four broad thematic concerns: materiality, society, economy, and temporality. This order resonates with the view in ecological economics (Daly and Farley 2004) that the physical environment is the condition for social life and the economy is part of that life. It also resonates with Thill's (2015, 8) contention that '[w]aste is every object, plus time'.

The Critique of Materiality (Part I) begins with an exciting account of how \$2 recycled microchips from unruly bazaars in rural China can end up threatening the reliability of tens of millions of dollars' worth of US military equipment. Tracking how global supply chains in the defence industry integrate e-waste, Josh Lepawsky in 'Weaponizing Waste' (Chapter 2) shows how the material characteristics of counterfeit and reused components can branch out into a destabilization of private interests in the defence industry, as well as offering serious threats for state security and international relations. With a similar focus on materiality, Jennie Olofsson draws our attention to the similarities that exist between ambitions of an efficient control of leakages from waste and from menstrual substances. In 'On the Socio-Material Practices of Leakage Control: Waste Infrastructures and Bodily Discharges' (Chapter 3), she draws on a reading of both feminist theories and discard studies to produce a critique of containment ideas and ideals that questions the view of leakages as accident, disruption, shame, and losses that should be concealed. She stresses instead their productive qualities as traces and forms of resistance to containment. Productivity is also the ever-present predisposition of all objects to become waste: their so-called wasteness, Taru Lehtokunnas and Elina Närvänen explain in 'From Thin to Thick Relationships with Objects: Constituting Subjectivity through Consumer-Object Folds' (Chapter 4). Here, bananas, smartphones, and used armchairs illustrate how the transition of objects into waste, far from being ignored by consumers, actively contributes to consumer subjectivity by elaborating relationships between the consumer and the consumable object. Human beings are more intimately entangled with waste than current waste management and zero waste ideals of the circular economy would have us believe, argue Olli Pyyhtinen, Alma Onali, and Stylianos Zavos in 'Waste as Posthuman Critique' (Chapter 5). It is fallacious to propose an ontologically hygienic separation of human beings from (waste) materiality. It is not only that waste takes every possible opportunity to manifest its rebellious character and refuse effacement. It is also that waste, far from being passive and inert, is already actively intertwined with all moments of the human. Only an attentive approach to materiality would be able to handle these dis/entanglements.

Part II presents a Critique of the Social. Nadine Arnold opens this critique by questioning governance by the social norms that are standards. In focus here is the mismatch between the global and abstract view of standards and the local realities that need to fit their expectations. Her 'Feeding the Critique of Standards with Waste: Exclusion and Reactions in Food Systems' (Chapter 6) shows how standards actively produce waste, her case demonstrating the need for a more critical view of the procedures of rational inclusion and exclusion that such standards enact and reproduce. Marisa Solomon continues with a condemnation of the social norms that underpin the spatial logic of racial capitalism in the USA. In 'From Refuse to Refusal: Disrupting Racial Capitalism's Wasting Relations' (Chapter 7) she denounces Material Recovery Facilities (MRFs) and landfills as powerful techniques of dispossession and enclosures. She details how these reproduce the prejudicial, discriminatory, and violent injustice towards Black life that characterizes the country's racial history, and explains where, when, and how they can and should be refused. The stigma attached to waste easily turns into prejudices against those who entertain intimate relationships with it. As further emphasized in the 'Grassroots Social Innovations of Waste Pickers as Critique of the Existing Social Order' (Chapter 8), much of the world's waste management is in the care of a population routinely stigmatized, scorned, and marginalized and wrongly labelled as the informal waste sector. In a spirit of climate justice and just urban transition, Jutta Gutberlet and Isabella de Carvalho Vallin explain how the grassroots movements processing waste in the Global South are structured as resourceful and innovative initiatives that are essential to urban metabolism and sustainability. This is why they deserve social, political, and economic recognition. Reverting to the Global North, Hervé Corvellec ends this section with 'The Resourcification of Waste: A Critique of Heroic Efficacy' (Chapter 9) which presents the view of waste as a resource in the three contexts of the waste hierarchy, lean management, and the circular economy. Here, the belief that even waste can be a resource is shown as an expression of an overconfidence in humans' ability to be effective that prevents any acknowledgement of humans' limitations and weaknesses, despite the fact that humility is an urgent necessity in the Anthropocene. Because waste offers an outsider perspective, such waste-based critiques allow for a critical look at how the social is organized.

Part III offers a Critique of the Economy. In 'Waste as a Critique of the Concept of the Economy' (Chapter 10), Zsuzsa Gille draws on Michel Callon to question the economization of waste by Marxist and liberal approaches, for example, at work in the measurement of waste. She also shows that Callon

is incapable of freeing himself from the value-centredness that is inseparable from the economy. Her chapter leads to a plea for an economic theory that overcomes the serious limitation of having no account of materiality. Melanie Samson's chapter also links value and materiality. 'Not at Our Disposal: Reclaimers' Critique of Disposability Capitalism' (Chapter 11) delves into the cultural history of South Africa to show how patriarchal, white supremacist colonial capitalism feeds its production of value on a parallel treatment of people, nature, and commodities as entirely disposable and at the disposition of capitalists. The condition of reclaimers brings into plain sight the de-humanizing and exploitative character of disposability capital as an economic system. Staying with disposability, Patrik Zapata and María José Zapata Campos suggest in what amounts to a critique of property considering what has been disposed as a commons. 'Waste Commoning as Critical Answer to the Property Question' (Chapter 12) departs from waste prevention initiatives to demonstrate how free access to commons can mitigate the limitations of the dualism of private or public ownership in addressing environmental issues. Presenting commoning as a practice-based critique, they suggest that it can serve as an insurgent, guiding principle for environmental private actions and public policies. Instead of directing their critical gaze at property, Myra Hird and Gabriella Dee target growth. In 'Mother Earth and Her Three Little Wasteful Pigs: Waste Reduction through Degrowth', they revisit the fable of Three Little Pigs to develop a critique of settler colonialism, neoliberal capitalism, and social injustice based on a discussion of the feasibility of degrowth as an alternative to prevailing current economics. Economization, disposability, property, and growth: waste reveals itself as a multi-faceted critique of the economy.

Finally, the fourth section offers a Critique of Temporality. In 'Waste, Temporalities, and Critique on Event-Based Environment Justice: A Political Ecology of "Slow Violence" of China's "Production Wastescapes"' (Chapter 14) Kun Wang and Raymond Yu Wang draw on the environmental degradation of the Pearl River Delta, China, to understand industrial wastescapes as accumulation. Adopting a temporal mindset that they combine with political ecology, they suggest seeing environmental justice in the *longue durée* rather than in the limited temporality of events. Their effectively processual view of pollution—folding the past over the present—is echoed by Zachary Riebeling. Reminding that single-use plastics, nuclear contaminated articles, and the like are artifacts that shape times that will come, he suggests in 'Waste and the Historical Future' (Chapter 15) that the Anthropocene, arguably the age of waste, makes it necessary to fold the historical

future over the present and rethink historical time and subjectivity in a way that anticipates an unprecedented merging of social and natural history which consequences are still to be established. Together, these two chapters invite a re-examination of the agency of temporality in a time of urgent environmental degradation. Two further chapters consider how waste relates to deceleration. In 'Wasting to Slow Down Time: The Paradox of Informational Waste' (Chapter 16), Dietmar Offenhuber departs from informational waste, or infotrash, to explain how technologies of computational friction consume labour and energy to create value for producers by deliberately slowing down users, from informational clutter and clickbait, to the architecture of Bitcoin mining. Connecting data, materiality, value, and temporality, he invites us to bring a more critical eye to the alleged seamlessness, placelessness, and consistency of the digital developments that increasingly shape our world. Then, in an auto-ethnography of cookery and gaming, Kelly Alexander and Joshua Reno in 'Attempting to Waste Time: An Exploration of Freewheeling Creativity in Kitchens and Gaming Rooms' (Chapter 17). Their empirics disclose both the difficulties and the rare windows of opportunity that capitalism provides for deliberately wasting time by performing, with great enjoyment, activities of creative idleness that they neologize as freewheeling practices. From invoking the past and the future to understand the present, to slowing down processes and engaging in freewheeling activities, wasting it invites us to rethink time and our relationship to it.

These contributions illustrate, each in its way, the critical potential of a waste-based approach. Yet other approaches could demonstrate this potential, though, two of which deserve special mention: literary studies and the visual arts. Italo Calvino's short story *Leonina* (1974) is a transparent critique of the ideology of the new in consumption society, and Michel Tournier's novel *Gemini* (1998) establishes poetic correspondences between the management of waste and the rejection of homosexuals (in pre-Second World War France), immigrants, and petty thieves, with waste serving of a unifying ground for a redemption of humanity by marginality. More academically, the study of how texts as diverse as the Bible, medieval English sanitation ordinances, and Hamlet have been haunted by waste can serve to problematize the ethics of Western capitalist cultures of excess and environmental destruction (Morrison 2015). The visual arts also offer an endless catalogue of waste-based critiques. To question the role of social contexts in art production, the film *Waste Land* (Walker et al. 2010) depicts how the Brazilian artist Vik Muniz collaborates with *catadores* (pickers) to produce art photographs of large mosaics composed of objects collected from an open-air landfill and that reproduce classical paintings such as the *Death of Marat* by

Jacques-Louis David. Many sculptors and painters today use waste as a material for their productions, to name arbitrarily two: Mark Dion's *Tate Thames Dig* (1999) critiques classificatory systems by displaying discarded objects retrieved from the river in front of Tate Modern in a contemporary Wunderkammer; for *Sound Wave* (2007), Jean Shin melted and sculpted vinyl records into a cascading black wave to denounce the destructive production of obsolescence of goods and ideas through technological change. The critical use of waste in literature and arts is as disruptive as it is polymorph and would deserve a volume of its own.

Critical Waste-Based Epistemology

The contributions to this volume lay ground for a critical waste-based epistemology. Such an epistemology uses the polymorphic omnipresence of waste and unbridled wastefulness to which humans have become accustomed, to know the world, for instance, in line with Lepawsky who suggests that waste makes it possible to understand the difference between dirt which is not having 'somewhere to fit in a broader system of ordering', and discards which have a 'rightful place' (2023, 2) in the economic system to question the ethics of classifying. Thinking along with Hird who suggests that 'we know ourselves through waste' (2012, 456), the chapters in this volume illustrate how waste offers entries to understanding the social.

A critical waste-based epistemology is a specific way to know the social. Its first characteristic is the objects of study from which it departs. These objects are human, for instance, waste pickers, but they also include human discharge such as menstruation. They are also concrete material(s), such as counterfeit chips, second-hand consumer goods, and infotrash; or they are abstract constructions such as waste measurements, degrowth, or a wasting of time. They are even spatial, for instance, material recovery facilities (MRF), landfills, or a polluted industrial region. Beyond this diversity, these objects have in common to be inglorious. Contrary to studies of art, science or strategy that deal with hoisted objects of study, the objects of a critical waste-based epistemology do not shine. They present defects, have been rejected, and are viewed as decay in becoming. Objects of a critical waste-based epistemology are stigmatized, tabooed, uncelebrated, unattractive, and notorious. They evoke dirt, risks, and even bad smells. Hird (2012) sees waste as an epistemology of the inhuman; critical waste-based epistemology is more an epistemology of the Pandemonium (Burrell 1997). The points of departure of a critical waste-based epistemology are things that, if we dare to

speak in general terms, the Enlightenment has preferred to ignore, neglect, and implicitly deny, more about this shortly. In a spirit of Foucauldian critique, the objects of critical waste-based epistemology tend to belong to an unthought of reason. As such they are in themselves already critical in that they are invitation to look and see at what is otherwise routinely and systematically overlooked. Ingloriousness gives a critical waste-based epistemology an initial momentum.

The second characteristic of a critical waste-based epistemology is to be structured around pairs of concepts that delineate a problem and its nature. Examples of such pairs are risk and safety, leakage and control, global governance and local contingencies, racial exploitation and resistance, planet boundaries and degrowth, friction and transparency, and industrial pollution and environmental justice. In a Foucauldian spirit again, the first term of these pairs discloses a matter of concern and makes it visible. The second term explains why it is a problem, exposing its nature by listing the tensions, contradictions, and adverse consequences to which it leads. This move from disclosure to explanation is cardinal to how a critical waste-based epistemology produces knowledge. Whereas the problem that it identifies is often local—waste is always somewhere, thus spatial—the problematization that it offers draws on broad principles such as the pursuit of knowledge, security, rationality, control, transparency, justice, value, freedom, growth, and progress that evoke universal ambitions. And to this list, one should add an interest for forms of resistance to power (e.g., [Solomon 2025](#)) which is yet a recurrent trait of critical waste-based epistemology.

Third, problematizations of critical waste-based epistemology rest on a holistic or nonseparative understanding of humans and their physical environment. As the etymology of the French term *déchet* and German term *Abfall* conveys, waste combines a separation (prefix *de-* and preposition *ab-*) and a fall (*-chet* is derived from *choir* that means to fall, which is also the sense of *fallen* in German). Correspondingly, waste has been conventionally separated, distinctly labelled, and made to fall away or disappear from sight: an object to avoid, for example as a threat to public health, for the outside-perspective of the outcast (e.g., [Laporte 2000](#)). Instead, critical waste-based epistemology rests on the view of waste and waste-related issues as human productions that keep returning to humans and constrain how humans can act. To the persistence of ideals of separation inherited from Aristotle—of man from nature in St Thomas Aquinas, soul and body for Descartes, or profit and environmental destruction in the economy—critical waste-based epistemology opposes a nonseparation stance. It dutifully notes that the Anthropocene, by some renamed the Wasteocene ([Armiero 2021](#)),

is a Declaration of Dependence (Enroth 2020) that casts a new light on human–environmental interactions and the related feedbacks (Olsson et al. 2017) that efforts at social transformations need to take into account lest they be doomed to fail. Some speak of engagement (e.g., Zapata and Zapata Campos 2025); others of posthuman entanglements (Pyyhtinen et al. 2025). Critical waste-based epistemology is nonseparative in a way that resonates with Bruno Latour's (2023) characterization of modernity in which man and nature are deceptively separated. It also chimes with what Hartmut Rosa and colleagues (Hollstein et al. 2023) call *Weltbeziehung* to depict a coherence of self and world embodied in a reciprocal and mutually transforming relationship. What matters is that it puts relationships in focus, assuming that they are essential to understand the social, regardless of whether they are between humans, materials, ideas, places, or otherwise.

To speak again in general terms, a fourth characteristic of a critical waste-based epistemology is to call on principles from the Enlightenment to address those problems that the Enlightenment is not so zealous to see and address. Critical waste-based epistemology contributes to the emancipatory project of the Enlightenment understood as:

a diverse intellectual movement whose general direction was to use free, critical reason, untrammelled (as far as one was consciously aware) by authority and tradition, in order to understand the universe, man's place in it, human nature and interaction, to improve the economic and political institutions of society and the conduct of individuals, to understand the proper uses of power and the proper relations between individuals and the community or state; and by so doing, to enhance human happiness and the quality of life. (Crocker 1988)

Critical waste-based epistemology thus dovetails with Kant's understanding of enlightenment as a release from 'tutelage' (Kant 2007, 29). Having identified a problem and made it visible, critical waste-based epistemology suggests redressing it with some general pragmatic principles to find a solution. Examples of such practicalities proposed in this volume include: actively engaging with wastefulness in consumption; reformulating standards so as to better meet local contingencies; implementing social initiatives that remedy to the ills of racial segregation and exploitation; developing commoning to evade the limiting dichotomy of private and public property; addressing the deliberate frictions that characterize the internet; and/or anticipating the future to prepare ourselves for the Anthropocene. The critical waste-based epistemology aims to show that the problems that it has made visible might have solutions, even if they are difficult to implement.

Admittedly, the chapters of this volume each derive from an invitation made to contributors specifically to depart from waste and to formulate a critique. However, the resulting critical waste-based epistemology builds on the recurrent concern of discards and waste studies (e.g., [Gille and Lepawsky 2022](#); [Liboiron and Lepawsky 2022](#)) to stress the imperious need to see and remedy to the current and future global waste crisis. The critical waste-based epistemology starts in the Pandemonium. Yet, when it lands on denunciations of injustice, stigmatization, and loss of opportunities, it branches into the Enlightenment's ideal of emancipation and progress.

The critical waste-based epistemology thus entertains ambiguous relationships with the Enlightenment. As an epistemology of rejection, failure, and stigma, it is a critique of a certain form of denial and ignorance that characterizes the Enlightenment. In Foucault's sense, it is a critique of non-reflexive modes of thoughts of the Enlightenment. At the same time, though, critical waste-based epistemology certainly relies on the ideals of the Enlightenment to denounce when objects, people, and the environment are denied these ideals. And when it turns to solutions, critical waste-based epistemology perpetuates the Enlightenment project, in the sense of Kant's view, of a mature emancipation from tutelage.

The rationale of critical waste-based epistemology is to re-orient the principles of Enlightenment towards the refuses that it refuses to see. As an epistemology, it draws on democratic ideals of justice, efficacy, progress, value, and emancipation to denounce and find solutions to stigma threat, risk, overflow, unbalance, and discrimination, in particular if these are unseen, implicit, forgotten, and made invisible. The rationale of a critical waste-based epistemology becomes a folding over of the Enlightenment onto what the Enlightenment denies.

To Put It Briefly

Drawing on both the insistent material ubiquity of waste and on recent developments in discards and waste studies, this volume aims at showing how one can depart from waste to develop an epistemological lens that critically examines and reassesses the social world. After a brief explanatory detour exposing the philosophical underpinning of critique and a presentation of the contributions to this volume, four indicative characteristics for a critical waste-based epistemology are suggested. First, critical waste-based epistemology departs from inglorious objects that despite their manifest ubiquity are routinely ignored, spurned, scorned, and belittled. Second,

critical waste-based epistemology develops problematizations by associating some frequently local, social matter, with general notions that demonstrate its significance. Third, these problematizations develop via a determinedly holistic and non-separationalist stance that, contrary to conventional understanding of waste as separated from its makers, insists on the structural and dynamic relationships that humans entertain with their waste and the physical environment. Fourth and finally, critical waste-based epistemology calls on emancipatory solutions to the social and material ills it has identified.

Critical waste-based epistemology departs from a human-made materiality that has been abandoned and arrives at a plea for reconnection of humans with much that they endeavour to separate from themselves: from exhaustion of natural resources, pollution, and any destruction of the physical grounds for social life; from other humans perceived as bearing any kind of difference. From the grounds of discrimination covered by the law prohibiting discrimination, for instance, gender and transgender identity or expression, ethnicity, religion or other belief, disability, sexual orientation, and age. From non-human forms of life, to start with industrial exploitation of the reproductive capacity of animals. From places sacrificed on the altar of progress or distraction of the wealthy; or from pasts and futures that they find uncomfortable and do not want to identify with. At the risk of a final over simplifying, critical waste-based epistemology folds the Enlightenment back on itself in applying general principles, typical of the Enlightenment, to plead for the liberation of objects that the Enlightenment routinely ignores.

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PART I

MATERIALITY

Weaponizing Waste

Josh Lepawsky

Introduction

On a fair and sunny Tuesday in November 2011 the United States Senate Committee on Armed Services, its staff, and key witnesses assembled in room SD-G50 of the Dirksen Building in Washington, DC (see [Figure 2.1](#)). They were there to consider testimony about a critical national security problem. It was the size of a paper clip.

Opening the hearing in his role as Chair, Senator Carl Levin explained:

systems that we rely on for national security and the protection of our military men and women depend on the performance and reliability of small, highly sophisticated electronic components. Our fighter pilots rely on night vision systems enabled by transistors the size of paper clips to identify targets. Our troops depend on radios and GPS devices and the microelectronics that make them work to stay in contact with their units and to get advance warning of threats that may be just around the next corner. The failure of a single electronic part could leave a soldier, sailor, airman, or marine vulnerable at the worst possible time. A flood of counterfeit electronic parts has made it a lot harder to have confidence that will not happen. (Senator Levin [‘Transcript of Hearing’ 2011](#), 2)

Testimony from Senator Levin jarringly juxtaposes differences of size and importance. The Committee’s report, published a year later, opens with an observation from General Patrick O’Reilly, the Director of the US Missile Defense Agency at the time: ‘We do not want a \$12 million missile defense interceptor’s reliability compromised by a \$2 counterfeit part’ (General Patrick O’Reilly [United States Senate Committee on Armed Services 2012](#), i). A tiny, single electronic part might be responsible for a supersonic fighter aircraft crashing to the ground. Key witnesses at the hearing included vice presidents (VPs) from multibillion dollar military contractors such as Boeing, Raytheon, and L-3 Communications, all of whom are concerned



Figure 2.1 Top: Exterior of the Dirksen Building (US Capitol 2011). Bottom: The scene inside room SD-G50 (United States Senate Armed Services Committee 2011)

about ‘\$2 counterfeit part[s]’. Over the course of his opening remarks Senator Levin would go on to reference 1800 cases of one million individual parts that were investigated by the US Department of Defense (DOD): ‘the overwhelming majority’ of which were traceable to China (Senator Levin ‘[Transcript of Hearing](#)’ 2011, 3). However, these problem parts do not originate in China, explained the senator. Instead, the material for these counterfeit parts was

‘electronic waste, e-waste, shipped from the United States and the rest of the world to China’ (Senator Levin ‘Transcript of Hearing’ 2011, 3). Huge numbers of such tiny parts were flowing from the United States and elsewhere to China through globally distributed reverse supply chains for discarding and recycling electronics.

A paper-clip-sized component is more lethal than the helicopter it rides in with its locked and loaded anti-submarine ‘Hellfire missiles’ (Senator Levin ‘Transcript of Hearing’ 2011, 4). These tiny, ‘micro’, electronics derived from waste are, according to the Senate Armed Services Committee, a national security threat of global proportion between the geopolitical leviathans of the United States and China. How could such a seemingly strange situation arise in which micro actors made from garbage threaten the coherence of macro actors armed to the teeth? Part of the answer, as we will see, lies not with malevolent adversaries foreign to the United States, nor with impersonal ‘market forces’. Instead, the chapter argues, the responsibility for this state of affairs is nested within deliberate actions of domestic business interests and with their political allies, which oppose government competition in those areas of commerce they deem ought to be their own.

The explicit invocation of e-waste and weaponry as a source of threat to national security in the Senate Armed Services Committee hearing suggests it could be crucial to think carefully about both the meaning of ‘waste’ and its ‘weaponization’. ‘Waste’ is often construed negatively. It is something to throw out, and not something to keep; or it connotes a squandering of something that might otherwise have been valuable. However, as scholars in various fields of the humanities and social sciences show, examining waste critically can lead to new insights and deeper understandings of phenomena that might otherwise be normalized and settled as simply the way things are, rather than as contingent and historical conjunctures of people, places, and things that could be arranged otherwise (even if doing so might be difficult).

If one doubts that conceptual or practical links can be found between waste and weaponry, then anthropologist Joshua Reno (2020) allays them. Reno writes,

Wars are wasteful. They lay waste to landscapes and lives [...] [b]ut preparing for a war you never fight is also wasteful. Even if shots are never fired, bombs never dropped, permanent preparation for war diverts natural resources, productive forces, and political focus away from other pressing concern. (2020, 1)

Reno’s words recall those of Dwight D. Eisenhower in his ‘Chance for Peace’ speech of 1953 in which he argued that an arms race between the United

States and the Soviet Union would be ‘a wasting of strength that defies the American system or the Soviet system or any system to achieve true abundance and happiness for the peoples of this earth’ (Eisenhower 1953). The point is not to cast Eisenhower or his speech as either innocent or disinterested—as we will see his administration (and others) is an important actant in the drama played out in room SD-G50 that Tuesday in November 2011 during the Senate Armed Services Committee hearing. For the moment, however, we can take Eisenhower’s words tactically at face value so as to initiate a certain kind of critique.

Documenting the epistemological and ontological fluidity of waste and weaponry—by questioning what counts, by whom, for whom, when, where, and under what conditions—is a form of critique that implicitly accords with philosopher Michel Foucault’s notion of the term. Foucault contests the idea that critical analysis, or critique, consists of a finger-wagging exercise in denunciation (Foucault 1982). Instead, the point of critique as a mode of analysis is to use it to ferret out taken-for-granted assumptions—the explicit and implicit presuppositions—that provide an *episteme*, or a semblance of coherence to the foundation of knowledge about some phenomenon or other. Such questioning is valuable if for no other reason than both stated and unstated assumptions informing ostensibly coherent knowledge about something make some forms of acting upon it thinkable, while equally revealing what possibilities are rendered as unthinkable under those same assumptions. As such, critique enables an analyst to question what was previously accepted ‘without saying’ (Foucault 1982, 34) and, thus, change systems of thought about those phenomena so as to be able to interpret them anew and, potentially at least, act differently with relation to them. This chapter is driven by this Foucauldian notion of critique. It asks: what might the invocation of ‘e-waste’ with respect to US military supply chains reveal about those supply chains? What might it disclose about the assumptions on which their operations rest? And what operations of associated, but perhaps less obvious, systems might also be disclosed by the invocation of ‘e-waste’ as a threat to US military supply chains?

Drawing on, and departing from, the theoretical reaches of anthropologist Mary Douglas on the relation between dirt and systems, discard studies argue that there are important distinctions to be made between waste and dirt (Liboiron 2019; Liboiron and Lepawsky 2022). In Douglas’ formulation waste and its cognates—such as garbage, trash, or rubbish—do not relate to the systems in which they arise in the same way that dirt does. As Douglas argues, waste has a proper place within a given system. Waste belongs in a system, it does not threaten it. Treated as waste a person, place, or a thing might

be misplaced or displaced, but not out of place (Liboiron 2021). Dirt is fundamentally different. It is a threat to the continued coherence and ongoingness of that system. Waste might become dirt, for example as more and more carbon dioxide is ejected from industrial systems, it is overspilling its practical and conceptual containment in the form of 'emissions' as it comes to threaten the operation of more and more interlocking social and ecological systems. In this sense excessive CO₂ is becoming dirt. Analogously, electronic parts that are characterized as 'e-waste' are also deemed to 'pollute' military supply chains. As materials exported from the United States to China for 'recycling' e-waste had an established, legitimate place. But when it returns as counterfeit electronic parts, e-waste becomes a threat to the functioning of US military weapons systems. E-waste becomes dirt, in this sense.

With the caveats above regarding Douglas' ideas, her phrase '[w]here there is dirt there is system' (Douglas 1966, 36) can be taken as a methodological bumper sticker. Identifying something as dirt offers a clue towards understanding the character of the system (or systems) from which it must be discarded, so that those systems may continue to operate. In either metaphorically or materially plucking at dirt, additional strands and threads composing the networks of entangled system(s) that are attempting to eject it can come in to view and be opened to the practice of critique on which this book is premised. What I hope to demonstrate in the rest of the chapter is that the issue of e-waste and counterfeit electronics in the US military supply chain is symptomatic. Not as the result of impersonal market forces, as testimony at the Senate Armed Services Committee suggests, but emerging from the decisions undertaken by multiple presidential administrations between the 1950s through the early 1990s. Further, I hope to demonstrate that these decisions were in response to specific actors whose goals were (and continue to be) to fundamentally re-orient the relations between the public sector and the private sector away from the former and in favour of the latter. Moreover, while 'e-waste' is symptomatic, the idea of 'waste' is itself weaponized by specific business interests and their political allies in their struggle to dismantle what they deem to be the inappropriate intrusions of the public sector into what should be the realm of private business. This most especially applies to the military which they construe as 'the single most wasteful, anti-capitalist component of the American state' (Mittelstadt and Wilson 2022, 16). The idea that any provisioning done by the state is inherently anti-capitalist does not, of course, hold up to any serious historical analysis of political economy. To be clear, the state and capital accumulation go hand in hand. Nevertheless, specific business interests and their political allies in the United States have found and developed the means to turn the idea that state provisioning

itself is a threat to free enterprise, to the point that it is anti-capitalist, and into a means of gaining advantage in their ongoing struggle to place private power over that of the state. The US military was—and remains—a key battleground in this war and ‘waste’ was (and is) weaponized to fight it.

Counterfeit Electronics Come to Pollute US Military Supply Chains

Counterfeit electronic parts as a matter of concern for the US DOD can be traced back to at least 2004. As Senator Collins noted during the Senate Armed Services Committee hearing of 2011, ‘I would point out that this problem is not a new one. I recall back in 2004 looking into this issue of the security of the supply chain. And at that time in 2004, the Department of Defense initiated the Trusted Foundry Program’ (Senator Collins ‘[Transcript of Hearing](#)’ 2011, 29). The Trusted Foundry Program was initiated by DOD via an annual contract with IBM, ‘to provide government-wide access to leading-edge microelectronics in a trusted environment’ (Mak 2015, 1). The programme was still in operation at the time of the Senate Armed Services Committee hearing in 2011. However, in October 2014 IBM announced that it would sell off its microelectronics fabrication facilities to another manufacturer, GlobalFoundries. GlobalFoundries, headquartered in Malta, New York, was created as a spinoff of another microelectronics manufacturer, AMD (founded in Santa Clara, California), and was privately owned by the sovereign wealth fund of the United Arab Emirates until the company went public in October 2021. The firm operates manufacturing facilities in New York state, Vermont, but also in Germany and Singapore. Partly as a consequence of the change in ownership away from IBM and partly because of the location of its manufacturing facilities, DOD trust in its abilities to source ‘critical microelectronics’ was compromised (Mak 2015, 1). The Trusted Foundry programme was largely a response to concerns about the overall security of DOD supply chains as those supply chains globalized, rather than counterfeit parts per se (Mak 2015).

Three years before the Senate Armed Services Committee hearing, *Bloomberg Business Week* published an article called *Dangerous Fakes* on ‘[h]ow counterfeit, defective computer components from China are getting into U.S. warplanes and ships’ (Tschang and Edwards 2008, 1). Tschang and Edwards describe how ‘[f]ake microchips flow from unruly bazaars in rural China to dubious kitchen-table brokers in the U.S. and into complex

weapons' (Tschang and Edwards 2008, 1). The Bloomberg journalists quote retired General William G. T. Tuttle Jr, who states, 'What we have is a pollution of the military supply chain' (quoted in Tschang and Edwards 2008, 1).

At one point in the Senate Armed Services hearing of 2011 Senator John McCain quotes from the *Business Week* article noting that 'much of that pollution emanates from the Chinese hinterlands [and] Business Week tracked counterfeit military components used in gear made by BAE Systems to traders in Shenzhen, China' (Senator McCain, 'Transcript of Hearing' 2011, 8). According to Tschang and Edwards the 'flood' of counterfeit parts 'results largely from the Pentagon's need for parts for aging equipment and its long efforts to save money' (Tschang and Edwards 2008, 2). *Dangerous Fakes* traces those 'long efforts' to the 1990s when the Clinton Administration, followed by that of George W. Bush, shifted military procurement to buying more components 'off the shelf' from smaller, independent distributors partly in response to federal affirmative action goals (Tschang and Edwards 2008, 2).

While Tschang and Edwards place the blame for those affirmative action goals at Clinton's feet, they actually originate in a series of much older presidential Executive Orders prohibiting racial discrimination in the US defence sector. Those orders flow from Roosevelt's initial Executive Order 8802 of 1941, followed by Dwight D. Eisenhower's 1953 Executive Order 10,479, Kennedy's subsequent Executive Order 10,925 of 1961, and finally Executive Order 11,246 signed by Lyndon B. Johnson in September 1965. Moreover, Johnson's Executive Order 11,246 was not entirely of the public sector's making. In 1961 under the auspices of 'Plans for Progress' 'a group of 300 leading corporations committed to achieving equal employment opportunity through voluntary affirmative action' (United States Department of Labor, Federal Contract Compliance Programs Office 2000, 26088). Having tested those plans for several years as business management tools in the private sector they were incorporated into Johnson's Executive Order, thus flowing from the private sector into government regulations. *Dangerous Fakes* eschews any reference to this longer history of affirmative action promulgated under the auspices of both Democrat and Republican administrations as well as private business. Meanwhile, the article takes a dismissive tone towards these affirmative action policies suggesting that they have allowed unqualified racially and economically 'disadvantaged' (Tschang and Edwards 2008, 2) suppliers to pollute military supply chains with fake parts. These fakes were sourced from the 'garbage-strewn streets' (Tschang and Edwards 2008, 1) of Guiyu—a city in the Shantou region

made infamous by environmental NGO reports of the era (cf., [Minter 2013](#); [Kirby and Lora-Wainwright 2015](#); [Schulz 2015](#); [Goldstein 2021](#)).

To make their case, the journalists profile a company called Port Electronics of Salem New Hampshire which supplied BAE with military grade chips obtained from a Massachusetts-based distributor, Aapex, that had itself bought those parts from a company called 'Hong Kong Fair International Electronics' based in Shenzhen, China. In the ensuing investigation by BAE in 2007 the company traced the origin of Hong Kong Fair's components back to Guiyu and ultimately blamed the situation on Aapex, despite the latter offering explicit warnings about the riskiness of supplying older and hard-to-find microchips. The shifting of blame by BAE away from itself to a small, relatively weak supplier is probably not surprising. It is an instance of an actant doing what it can to keep its operations smooth by pushing the behaviour of a less powerful actant away from its centre of operations. In the words of Aapex's owner, 'I got thrown under the bus by BAE' ([Tschang and Edwards 2008](#), 4)—a common turn of phrase and an equally explicit description of discarding.

BAE would come under scrutiny during the Senate Armed Services Committee hearing in 2011. Testimony from a vice president of the Boeing company alleged that BAE was responsible for the provision of 'refurbished/counterfeit parts' in an ice detection module in an anti-submarine and anti-surface warfare airplane called the P-8A Poseidon (see [Figure 2.2](#)). A document submitted as evidence to the committee in the form of a Supplier Corrective Action Request (SCAR) from BAE confirmed the presence of 'refurbished/counterfeit parts' that passed 'the screening measures' of BAE Systems ([BAE Systems 2010](#); see [Figure 2.3](#)).

The SCAR is charming in its workaday intimacy. 'Carrie' of BAE Systems working at a site in Irving, Texas writes to 'Brian' of Tandex Labs (a supplier to BAE) located in Irwindale, California: 'Brian, I hate to be the bearer of bad news, but it appears as though we received refurbished parts from Tandex, which resulted in a field failure on a critical piece of hardware' ([BAE Systems 2010](#)). The 'field failure' refers to the ice detection module on the P-8. During an investigation of the failure a BAE technician 'noted that he could hear something rattling around inside the module when it was removed from the plane. When he opened the box, the part had actually fallen out of the socket' ([BAE Systems 2010](#)). However, the Senate Armed Services Committee would hear testimony that Tandex itself did not make the part in question. Instead, Tandex had purchased the parts from a Florida-based supplier called Abacus Technologies, which was itself 'an affiliate of A Access Electronics in Shenzhen China' ([Transcript of Hearing' 2011](#), 6). This part, rattling around in a



Figure 2.2 P-8 Poseidon in flight (Davis 2012)

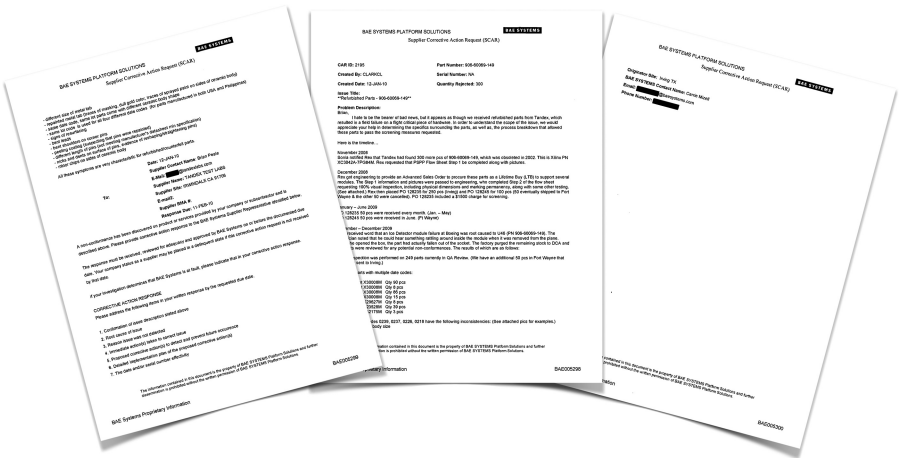


Figure 2.3 BAE Supplier Corrective Action Request (SCAR) (BAE Systems 2010)

module that a technician could hold in their hands, starts to elucidate globe-spanning military and commercial networks linking a multibillion dollar weapons manufacturer with a location in Irving Texas, a technology company in Irwindale, California, and a distributor based in Florida with facilities ultimately located in Shenzhen, China.

Globe-spanning and convoluted supply chains were seized on as a problem by the Senate Armed Services Committee. Senator Levin uses a case study of



Figure 2.4 An SH-60B in flight (Curimedia 2012). The FLIR system is the spherical module on the nose of the aircraft

a forward-looking infrared (FLIR) targeting system on a class of helicopter aboard a Navy destroyer, the USS Gridley, deployed in the Pacific. The helicopter is an SH-60B manufactured by Raytheon (see [Figure 2.4](#)). Transistors involved in the operation of electromagnetic interference filters in the FLIR system were found to be counterfeit, according to testimony.

Referring to a projected map on a large screen in the room Senator Levin shows witnesses a picture of the USS Gridley sailing past the skyline of Hong Kong and asks, ‘So how did a suspect counterfeit part end up in a night vision and targeting system intended for a Navy helicopter in the Pacific fleet?’ (Senator Levin ‘[Transcript of Hearing](#)’ 2011, 4). While the transistor looming over the USS Gridley on the map is deemed a threat to the US military supply chain, no one wonders how a US Navy gunboat sailing through Hong Kong harbour might be construed as a threat to China, nor questions how the ship came to be there—of course. Hearing participants are now in for some pedagogical theatrics (see [Figure 2.5](#)). With a world map projected on the wall-sized screen, a series of dots are connected with lines that follow the journey of the transistors along their multi-hop global travels. Testimony shows that Raytheon, then headquartered in Waltham, Massachusetts, acquired the filters with their counterfeit transistors from Texas Spectrum Electronics (TSE). As in previous examples discussed above, TSE

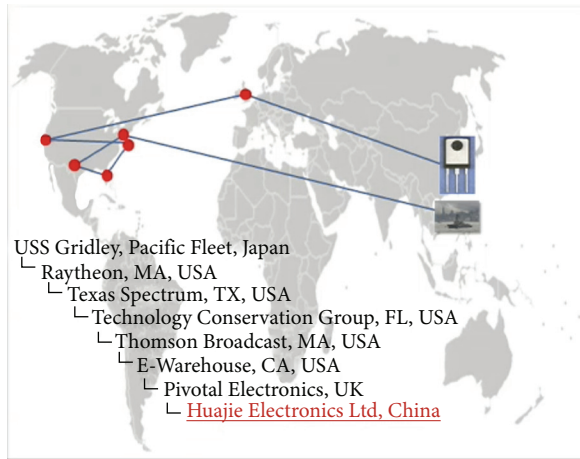


Figure 2.5 Map displayed and narrated by Senator Levin. The USS Gridley is shown on the right-hand side of the image, under the transistor ([United States Senate Armed Services Committee 2011](#))

did not itself manufacture the transistors in question. Instead, TSE bought the transistors from another company called Technology Conservation Group (TCG). Unlike other firms in the examples previously discussed, TCG is an electronics recycling and electronics components recovery company.

The Florida-based TCG company's submission to the Senate Armed Services Committee hearing details the travels of the parts in question. According to that submission, TCG received a shipment from Thomson Inc., then based in Southwick, Massachusetts. From Southwick the shipment travelled to TCG's facility in Louisville, Kentucky. Employees at the Louisville facility sorted and weighed the shipment. In total 72 pounds of 'miscellaneous inventory was recorded' and among that material were '342 pieces of Fairchild [redacted] semiconductors' ([Technology Conservation Group 2011](#), 1, 2). These semiconductors comprised the transistors in question. TCG determined that the shipment from Thomson was valued at just over \$134 and this amount was paid to Thomson. Notably, however, the dollar figure paid to Thomson did not include any value for the 'miscellaneous inventory' comprised of the Fairchild semiconductors. The latter suggests that Thomson did not consider those semiconductors to have sufficient monetary value to warrant receiving payment for them.

After inspection by TCG, the semiconductors were listed for sale and Texas Spectrum Electronics bought 60 of the 342 available semiconductors for a dollar apiece. Another 60 of the components were purchased by Global IC

Trading Group for \$0.84 apiece. The remaining 222 semiconductors were sold to a company called Sigma Technology Inc. According to TCG's submitted document, it was Global IC and Sigma who raised questions about the quality of the semiconductors they received from TCG. Following those complaints Sigma cancelled its order and Global IC returned the pieces it received for refund. The situation led TCG to determine the pieces comprising the Sigma and Global IC orders would 'have higher scrap value than [sic] resale value' ([Technology Conservation Group 2011](#), 2). The 60 semiconductors originally purchased by Global IC and the 220 purchased by Sigma were sent by TCG to Xstrata Recycling Inc. for smelting (Xstrata operated smelters in Quebec and New Brunswick, Canada; Xstrata was bought by Swiss-based Glencore in 2013).

Unlike Global IC and Sigma, Texas Spectrum Electronics never requested a return or refund from TCG. Texas Spectrum supplied the parts at issue to Raytheon, the final maker of the FLIR system. The ensuing investigation would eventually trace those components back to Thomson who purchased the parts from a California based distributor, E-Warehouse, which in turn had purchased them from UK based Pivotal Electronics (PE) and PE had purchased them from Shenzhen, China based Huajie Electronics Limited.

It is at this point in the political theatre of proof that an issue emerges that is ostensibly core to explaining the empirical patterns mapped out by Senator Levin and on the display in the room. The issue with the FLIR supply chain is its convolution allegedly arising from impersonal 'market forces'. An exchange between Senator Levin and Mr Kamath, VP Supply Chain Operations at Raytheon made the issue explicit:

CHAIRMAN LEVIN: Are you [Mr. Kamath] surprised that Raytheon's supply chain is as convoluted as this [as shown on map], considering that the parts are destined for a critical system?

MR. KAMATH: Mr. Chairman, I think I would characterize, given all the testimony we have heard today, it would not surprise me that there was a supply chain that is convoluted, using your words.

CHAIRMAN LEVIN. And is that something that we ought to worry about?

MR. KAMATH. Absolutely, yes, sir. (['Transcript of Hearing' 2011](#), 64–5)

The intent of the dramaturgy of Senator Levin's mapping of the supply chain for the FLIR provided by Raytheon seems to have been to elicit surprise about an American defence contractor's supply chains leading to China. Yet, who in 2011 could credibly be surprised by documentation that electronics manufacturing involves facilities in China? Clearly, not Mr Kamath.

The ‘globalization’ of the electronics manufacturing sector has been documented by many researchers, and it is not the purpose of this chapter to rehearse that geohistory (see [Yeung 2022](#) for a recent analysis).

No supply chain expert responsible for sourcing electronics could possibly be surprised to learn that China is responsible for manufacturing electronics. Indeed, according to Mr Kamath, the market for military electronics is not special. Mr Kamath remarked during his testimony that, ‘[a]s in any market, counterfeit electronic parts enter the DOD supply chain because of supply and demand’ (Mr Kamath ‘[Transcript of Hearing](#)’ 2011, 47). The latter claim suggests that the convolution of military supply chains is merely the outcome of impersonal market forces (‘supply and demand’). Yet, a more historical view demonstrates that systemic changes in how the US military provisions itself bely the claim that impersonal market forces offer a coherent knowledge formation about that system.

A Brief History of Privatization of the US Military

The US military has always provisioned itself through a mixture of public and private institutions. The role of quality parts in the reliability of weapons systems has been a perennial concern for the US military since before the Civil War. That concern has been at the heart of tensions between the appropriate role of government action, such as regulation, and private sector action in the form of innovation and profit making ([Smith 1985](#)). Indeed, the balance of power between the public versus the private sides of the ledger was (and remains) a contested issue. In the lead up to the Civil War, both government and private interests advocated the need for regulations that would standardize weapons systems and require interchangeable parts. The emergence of a largely public sector military establishment in the United States is mostly an outgrowth of the American experience of the two world wars.

In the aftermath of World War II ‘anti-statist business leaders and political allies’ ([Mittelstadt and Wilson 2022](#), 16) actively sought to dismantle the public provision of military goods and services which they saw as ‘the single most wasteful, anti-capitalist component of the American state’ ([Mittelstadt and Wilson 2022](#), 16). These interests were not military abolitionists. Instead, they wanted private control over military provisioning and access to the flow of public money that would result from that. Moreover, this targeting of the public provisioning of the military was only one front of a much broader war against what some influential private interests and their political allies construed as unfair competition from government. To make headway in their

campaign those interests turned the idea of government spending on military provisioning as a wasteful use of money and resources in an ‘anti-capitalist’ project anathema to ‘free enterprise’. In this sense, those interests turned a particular notion of waste into a weapon they could wield against what they perceived to be the undue encroachment of the state on what—they argued—should rightfully be the purview of private business interests. Organizations such as the National Association of Manufacturers (NAM) and the US Chamber of Commerce actively colluded with wealthy businessmen, influential clergy, writers, film makers, and journalists among others to resist what they argued was an inappropriate expansion of government, especially exemplified by the New Deal. It was a battle that was (and continues to be) as much spiritual as it was political and economic (Oreskes and Conway 2023).

A key impetus for reducing the public side and increasing the private side of the military ledger was the two Hoover Commissions of 1947 and 1953. Hoover, the former mining engineer turned politician, was a staunch critic of the New Deal era, of course. The Commission argued for example that ‘[e]xtravagance in military budgets and waste in military expenditure show a serious lack of understanding of the effect of the military costs and spending upon the total economy’ (United States and Hoover 1949, 187). The commissions focused on the entire Executive Branch, but it was the Department of Defense that received the bulk of its criticisms. The commissions recommended the selling off and privatization of large swaths of activities undertaken in-house by the military—everything from shipbuilding and aircraft manufacturing, to bakeries, coffee roasting, laundry, and tailor services (Mittelstadt and Wilson 2022, 17). One of the consequential results of the two Hoover commissions was the issuing of a rule by the Eisenhower administration that discouraged any federal government agency from engaging in ‘any commercial activity if that product or service can be produced from private enterprise through ordinary business channels’ (Mittelstadt and Wilson 2022, 17 citing The Federal Activities Inventory Reform Act and Circular).

Historians Mittelstadt and Wilson (2022) argue that the short-term effects of this policy issued by the Eisenhower administration were modest, while its long-term effects were far reaching. The push for a greater privatization of military provisioning continued over the next decades, but senior military officers often understood that push as ‘something imposed by Congress and civilian leaders [...] who were unduly influenced by private lobbies’ (Mittelstadt and Wilson 2022, 20). This struggle over the balance between public versus private provisioning of the military would come to a head in the 1970s with the transformation of the armed services into an all-volunteer force (AVF).

The creation of the AVF flowed from a campaign promise of President Nixon and a subsequent commission he assembled after winning the election. Membership of the committee included senior military personnel as well as future chairman of the Federal Reserve Alan Greenspan and none other than arch market fundamentalist Milton Friedman ([United States Government 1970](#); see also [Ath 2015](#)). The debates evident in the commission's report are a fascinating tug-of-war between ideals at once moral, political, and economic. Friedman argued conscription was both a tax and—because it relied on compulsion—‘incompatible with a free society’ ([Friedman 1967](#), 12). Commissioners in favour of fully private provisioning of the military advocated for an all-cash compensation system in which military personnel would ‘choose individually whatever “support” they wanted to “buy”’ from housing, to healthcare, to equipment ([Mittelstadt and Wilson 2022](#), 22). Military commissioners resisted full privatization on moral grounds based on values of public service.

The commission's report did lead to the creation of an AVF, but not the dream of full privatization advocated by some of the commissioners. Indeed, with the AVF came an expansion of the military role, and thus the public sector, in providing housing, education, health, and other non-monetary social welfare benefits to personnel. Military provisioning remained substantively on the public side of the ledger and the wish fulfilment of private-sector interests and their political allies were muted even under the Reagan administration. Not until the 1990s would the conglomeration of actors waging the anti-New Deal war by wielding the weapon of waste against public provisioning of the military start to see a major shift of military provisioning from the public to the private side of the ledger.

From the Last Supper to Private Equity Monopolization

Policy decisions in favour of privatization, not impersonal market forces, of both Republican and Democrat administrations transformed US military provisioning in ways that enhanced the probability that counterfeit electronic parts would make their way into military supply chains. According to [Dayen \(2020\)](#), George H. W. Bush reduced the defence budget by 26 per cent in constant dollar terms during his administration. Bill Clinton would reduce that budget a further 10 per cent. In conjunction with these budget cuts, and the linked policies flowing from Roosevelt's Executive Order 8802, Clinton's administration reoriented defence procurement policy in consequential ways with two pieces of legislation: the Federal Acquisition

Streamlining Act (FASA) of 1994 and the Federal Acquisition Reform Act (FARA) of 1996.

FASA ‘included a preference for Commercial Off the Shelf (COTS) items instead of the time-consuming and expensive process of creating government-unique items’ (United States Department of Defense 2022, 12). Meanwhile, FARA ‘extended the theme [by, inter alia] eliminating the requirement for cost accounting standards’ (United States Department of Defense 2022, 12) which effectively meant, ‘[c]ontracts under certain thresholds could go through with the contractor disclosing only minimal information’ (Dayen 2020, 173). The intent of this defence procurement policy reorientation was to increase competition, and thus reduce costs, for example by making it easier for small businesses to enter the defence supply chain as contractors, for example, as suppliers of commercial off-the-shelf (COTS) parts. Meanwhile, the Clinton Administration also created a policy environment that made it easier for financial firms to acquire manufacturing firms making up the domestic US industrial base of the defence sector. Ronald Reagan had permitted such liberal machinations elsewhere in the economy, but kept it largely muted when it came to the domestic defence sector (Stoller and Kunce 2019, 36).

The switch to COTS meant that military procurement supply chains, including those for electronic components, fused with civilian supply chains for those same products. The electronics sector had, of course, been globalizing for decades before Clinton’s reforms of the 1990s, but those reforms intensified a confluence of conditions that increased the probability of counterfeit electronic parts to enter military supply chains. On one hand, FASA and FARA made it easier for domestic US ‘mom and pop’ small business electronics distributors to enter military supply chains. On the other hand, the greater permissiveness around financialization of the domestic military manufacturing base that also occurred under Clinton’s policy regime meant ‘pressure on executives to make decisions designed to impress financial markets, rather than for the long-term health of their companies’ (Stoller and Kunce 2019, 31).

The pressure on the domestic military industrial base came from financial markets, but it also came directly from the White House itself. In 1993, Defense Secretary Les Aspin and other senior officials hosted a dinner—it came to be known as the ‘Last Supper’—for what were then America’s top defence contractors. Those contractors were told to ‘[c]onsolidate or evaporate’ (Stoller and Kunce 2019, 36). The contractors got the message and within five years the number of prime contractors to the US Defense Department was reduced from 16 to 6.

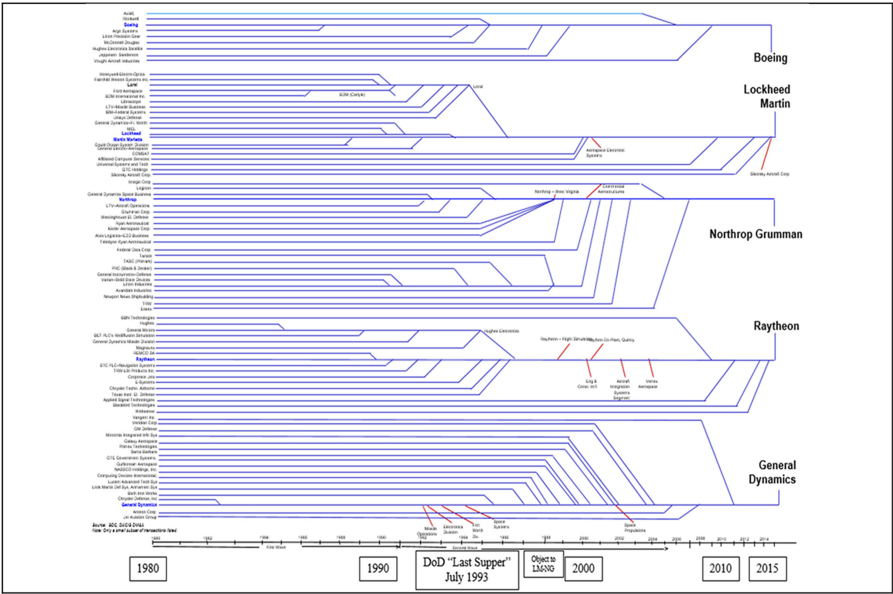


Figure 2.6 Consolidation of weapons manufacturers, 1980–2020 (United States Department of Defense 2022, 25)

As Stoller and Kunce (2019) argue, the basic play of financial interests was to focus on short-term profits at the expense of research, development, and production competencies. Once those short-term paths to higher profitability were played out, the next step was to offshore production to lower cost regions, typically China. Mergers and acquisitions continued through the late 1990s, and, as of 2015 only five prime defence contractors were left (see Figure 2.6).

The general goal of the anti-New Dealers of increasing the private side of the ledger and the specific policies of the Clinton Administration reorganized the system of military provisioning. As with any system, discards must arise for that system to continue to function as such. The offshoring of production capacity to China (and elsewhere) and the casting off of its American workforce for cheaper labour abroad are some of the results of such discarding.

The knock-on consequences of the Last Supper and Clinton’s policy reorganization of defence procurement under FASA and FARA had been playing out for almost two decades by the time of the Senate Armed Services Committee hearing on counterfeit parts in 2011. Those consequences had, over that time, created an environment attractive to finance capital in

general and private equity in particular. Finance capital was adept at hollowing out domestic industrial capacity and offshoring it to China and other low-cost production zones. Meanwhile, private equity used the reorganized defence procurement environment to monopolize key nodes in the defence supply chain, typically by buying up the few manufacturers of critical parts for weapons systems and, thus, creating chokepoint monopolies they could exploit for excess profits ([United States Department of Defense 2019, 2021](#); [Giblin and Doctorow 2022](#); [Hull 2022](#)). Private equity interests do not actually manufacture the parts they sell, they merely own the companies that do and then charge monopoly prices to the defence department to keep supplying those parts so that the weapons systems that need them can remain functional ([Dayen 2020](#)).

Although much more could be said about the financialization of the defence supply chain and the role of private equity flowing from the Last Supper and the Clinton Administration's policies shifts, what is important for the purposes of this chapter is the explicit, though partial way these issues enter into the Senate Armed Services Committee hearing on counterfeit electronic parts. During the hearing Senator John McCain refers directly to the *Dangerous Fakes* article in *Business Week* and quotes extensively from it about the role of e-waste. After emphasizing the 'garbage-strewn streets of Guiyu [that] reek of burning plastic' (Senator McCain, citing *Business Week* '[Transcript of Hearing](#)' 2011, 8), Senator McCain notes an additional risk: that 'defense contractors are often forced to purchase parts from independent distributors or brokers who may stock or have access to obsolete parts' (Senator McCain '[Transcript of Hearing](#)' 2011, 8). He continues:

We know that some of these people that are advertised as small business people are simply conduits with a phone and a desk for some of these parts. [...] We all want the small business people to be able to obtain DOD contracts, but not the kind of abuse that apparently also is practiced here. (Senator McCain '[Transcript of Hearing](#)' 2011, 8)

McCain's reference to the desirability of 'small business people' accessing DOD contracts is one of the specific goals of Clinton's FASA and FARA policy re-organization of defence procurement in the 1990s. However, noticeably absent from the Senate Armed Services Committee hearing on counterfeit parts is any reference whatsoever to the effects of financialization and monopolization of defence supply chains that flowed from those same changes despite their role in creating the conditions via the hollowing out and offshoring of the domestic industrial base that made the 'pollution' of the

defence supply chain with counterfeit parts far more likely. The *Dangerous Fakes* article that Senator McCain quotes liberally from devotes substantial investigatory attention towards the role of small ‘mom and pop’ defence contractors who act as distributors buying commercial off-the-shelf parts through online markets, many of which lead to China. The article also notes the Clinton administration’s rule changes in creating that policy environment. Yet no mention is made of the role of Wall Street or private equity in taking control of domestic military industrial capacity and offshoring it. It is telling that blame for the pollution of military supply chains is laid at the feet of less powerful actors on the streets of Guiyu and at the kitchen tables of mom and pop electronic parts distributors in the United States and elsewhere. Discarding is a technique of power. It is arguably no coincidence that the players whose interests align with anti-New Dealers that were further strengthened via Clinton’s policy reforms—financial and private equity firms—were not only absent from the witness panel in room SD-G50 of the Dirksen Building in November 2011, they were not even mentioned.

Conclusion

During the Senate Armed Services Committee of 2011 on the role of e-waste in US military supply chains such waste was construed not just in a negative sense but as being of existential threat. E-waste was not just waste, it was ‘pollution’; it was ‘dirt’; matter with no place and, thus, a threat to the continued operation of the system of US military readiness. Considerable effort is made during the hearing to suggest that this e-waste pollution was a deliberate plot by China as a growing adversary to the United States. Yet, in trying to make that case, committee members and witnesses do everything but draw attention to actual domestic business and policy actors and decisions, made over decades, in the contest to reshape the flow of public money away from the public sector and towards private interests of weapons manufacturers, financial firms and private-equity firms.

‘Waste’, as Reno (2020, 2) writes, ‘is a very flexible term with moral, economic, and ecological dimensions’. Part of what this chapter has attempted to do is demonstrate what happens when an analyst carefully follows the transition of a specific thing deemed to be ‘waste’ and becomes ‘dirt’ or ‘pollution’. While waste has a place in this or that system—for example, a bin for trash or recycling—dirt or pollution do not. As dirt or pollution, a person, place, or thing comes to be a threat to the continued operation of the system in question organized as it is. Noting this critical distinction between waste and dirt

or pollution helps an analyst understand how a paper-clip-sized microchip can come to threaten a whole military supply chain and national security system.

In bringing a discursive critique to the empirical case of a Senate Armed Services Committee on e-waste in US military supply chains this chapter also attempted to demonstrate the implications of some conceptual and practical linkages between waste and weaponry. On the one hand, evidence from the hearing shows that waste, in the specific form of e-waste, is literally incorporated into weapons systems via the globalized supply chains to provision the US military. In this sense, electronics cast off into recycling infrastructure in the United States and elsewhere follows circuits of supply chains that bring those materials to where manufacturers (mostly) are—China. Yet, flows of materials organized this way did not result from impersonal market forces. Instead, this chapter attempted to show that such a disposition of industrial geography is the outcome of active decisions traceable to key actors in the public and private spheres who ally together in a battle over the rightful distribution of relative power between private business and the state. In that battle waste is weaponized in another way as well, not just literally incorporated into helicopter gunships and anti-submarine jetliners. Since at least the New Deal era some private business interests and their political allies have been engaged in a war to beat back what they construe as an inappropriate expansion of the state and to win what they understand as their rightful position of power in the broader economy. In that war the US military has been a particular target. Especially in the post World War II era private business interests and their political allies understood the state's self-provisioning of the military—everything from equipment and food to housing, education, and healthcare—as a threat to private interests' ability to obtain and maintain control over the flows of funds dedicated to that provisioning otherwise done by the state. Under these conditions state expenditures on the military have been construed instrumentally by private business interests and their political allies as 'waste' as a means to tip the battle in their favour. The point, of course, of these allied interests was not to abolish the military but, instead, to enhance the flow of funds away from the public and towards the private side of the ledger. 'Wasteful' state spending was a means for those allied interests to make their case.

E-waste flowing freely from American recycling bins into China and then 'polluting' US military supply chains was a result of neither a nefarious Chinese plot nor of impersonal market forces. Instead, as we have seen, it was a result of a struggle over the appropriate disposition of private versus public provisioning underway in the United States since at least the New Deal

era. The American military has for a long time represented a threat to private American business interests and their political allies. These interests are not anti-military, they simply do not want the public sector to compete against their profit centres. Under conditions that ensure the flow of funds moves from the public side to the private side of the ledger, military spending is not just fine, it is desirable.

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On the Socio-Material Practices of Leakage Control

Waste Infrastructures and Bodily Discharges

Jennie Olofsson

Introduction: Leakage as a Trace-Making Practice

Leakage is a common part of our everyday lives, although rarely considered as such. While much of it is dealt with and managed without too much fuss or thought, leakage might also generate a substantial amount of (media) attention, at least when it concerns leakages of water, oil, gas, radioactivity, and (perhaps more recently) information. Here, and depending on *what* leaks, leakage connotes to some sort of urgency and immediacy that might also appeal to its newsworthiness, manifested, for example, as an increased number of clicks, likes, and comments.

In addition to the above instances, leakage has been a keen object of investigation from academic disciplines such as Science & Technology Studies (STS), critical geography, and anthropology (cf. [Star 1999](#); [Graham 2010](#); [Anand 2017](#); [Fredericks 2018](#)), and, perhaps more fittingly for the purposes of this chapter, feminist theorists and discard studies scholars (cf. [Grosz, 1994](#); [Shildrick 1997](#); [Young 2005](#); [van Wyck 2005](#); [MacDonald 2007](#); [Gabrys 2009](#); [Moore 2012](#); [Hird 2012, 2013](#)). While a more comprehensive conceptualization of this term has been somewhat absent, the above works succinctly show that leakage might emerge both as loss *and* excess, as valuable and risky, but above all as matter *out-of-place*.¹ Particularly in relation to feminist theories and discard studies, its out-of-place status might appeal to bodies, carbon sinks, sewer pipes, or landfills but indicates that leakage is relational and an inevitable effect of every attempt to contain, constrain, and accumulate. That said, and as also noted in earlier works (cf. [Olofsson](#)

¹ The idea of leakage as matter out of place draws on the classic work of Mary Douglas (2002) and her notion of dirt as matter out of place.

2016, 2023), while feminist theorists investigate leakage as it has come to mainly stick to women's bodies, and the stigma and taboo attached to these leakages, discard studies scholars commonly employ leakage to explore practices of waste management such as landfilling, tailing dams, carbon sinks, nuclear repositories, and sewer systems. Also, whereas the former explores the ways in which leakage is framed as a lived, embodied, and highly intimate matter—for the individual to manage and curb—the latter discusses leakage as it relates to waste and waste management, focusing particularly on the infrastructures that are deployed to treat waste. Here, leakage also largely emerges as a collective dilemma, in terms of an economic loss, an additional cost for taxpayers, or a potential risk to the environment and human health. What can be concluded is that prevention, management, and concealment of leakage seem to relate to efficient waste management, as well as to the sustaining of gendered orders. Leakage, then, is embodied and earthed, moved and transported, lived and institutionalized, but according to different logics and in dialogue with different monitoring practices. This means that leakage attains meaning and bites back differently depending on the logic of which it comprises part. While these logics might differ depending on the particular leakage that is being investigated, a joint reading of recent works within feminist theories and discard studies also reveals connections and similarities, especially when it comes to idea(l)s of containment and control.

This chapter offers a critique of these idea(l)s of containment, including human estrangement from, and domination of, more-than humans, that pervade much of Western thought. Drawing on a joint reading of feminist theories and discard studies, it thus engages in some of the logics that surround, and render leakage intelligible. In doing so, leakage is framed as a particular kind of trace-making practice.² The hypothesis is that inherent in leakage is a transformative, and above all, relational power that is evident if we look at leakage as a trace rather than a sole accident, disruption, shame or mishap. As stated in the work of Bruno Latour, '[t]o be accounted for, objects have to enter into accounts. If no trace is produced, they offer no information to the observer and will have no visible effect on other agents' (2004, 79). Leakage, then, seems to emerge as an issue, *only insofar* as it leaves traces and links to specific matters of concern. This is the case if we look

² Engaging in leakage as a particular kind of trace-making practice, I am particularly inspired by previous works within discard studies (cf. Laporte 2000; Rathje and Murphy 2001; Åkesson 2012; Reno 2014; Corvellec 2019). These works all highlight waste as a trace and a sign of life as well as a potential source of nutrition and fertility. In addition, the work of discard studies scholar Olli Pyyhtinen (2022) in which he discusses writing as a trace-making practice should be mentioned.

at recent works within discard studies, which critically explore practices of landfilling (cf. [Hird 2012, 2013](#)). Here, the main focus is on making sure that waste does not leak, that it does not enter into relation with other bodies. That said, as waste is never fully contained and controlled nor finally eradicated, it inevitably leaves traces, for instance in the form of leachate, methane gas, or radioactivity. As these substances seep into the surrounding environment, they might result in contamination and pollution, while simultaneously also speaking to an out-of-placeness in which that which leaks enters into unexpected relations with, and subsequently changes, other objects and bodies. Similar thoughts are expressed by feminist scholars when menstrual substances emerge as traces *in relation to* other objects such as clothes, seats, and floors, but also to products such as menstrual cups. Josefin Persdotter, for example, notes that as the cup accumulates rather than absorbs menstrual substances, the experienced messiness of using it is seen precisely in the cup's intermingling with other objects as the risk of dripping blood on the floor is much higher than with pads and tampons: '[w]ith the cup, the menses directly interact with a multitude of objects and technologies' (2022, 165). As such, menstrual substances, particularly those accumulated, might leave traces in the form of drips, splashes, and stains.

The above reasoning shows that while leakage is commonly seen as accidental, thus in need of control and regulatory practices, it also has the potential to reveal alternative routes and encounters, precisely through its status as a trace-making practice. To understand leakage as a trace-making practice then, is also to acknowledge it as a transformative and relational power. Leakage, to paraphrase the work of Astrid [Schrader \(2010\)](#) does not precede an environment, nor is its agency the property of a preexisting thing. Rather, leakage *is* only in relation to other bodies.³ The essence of leakage then, is rooted in relationships rather than in fixed qualities.

The relational ontology (cf. [Ingold 2006](#)) that characterizes leakage is seen, also among feminist theorists and discard studies scholars, as they share an understanding of (human as well as more-than-human) bodies as porous and leaky absorbents, always in extension and inseparable from the environment. Corporeality, to draw on the works of Karen [Barad \(2007\)](#), [Stacey Alaimo and Susan Hekman \(2008\)](#), and Joanna [Latimer \(2013\)](#), is always already involved in the more-than-human world. As bodies extend in this world however, they tend to stick to different others, both anticipated and sought-for, and unwanted. One example of this ambiguous state of corporeal

³ It should be noted that [Schrader \(2010\)](#), in her article, discusses the dinoflagellates *Pfiesteria piscicida* (the fish killer), not leakage.

extension is the work of performance artist Shauna M. MacDonald (2007) which highlights the transformative potential of menstrual leaks. Drawing on Victor Turner's notion of liminality, MacDonald (2007) notes that while many of our bodily leaks are to be hidden and concealed, they nonetheless (or perhaps just because of their status as hidden?) challenge Western notions of man/woman, mind/body, and culture/nature. The transformative power of leaks is evident, also in the work of discard studies scholar Jennifer Gabrys where she investigates carbon sinks as 'spaces of transformation as much as containment' (2009, 668). Here, bodies and environment mutually, albeit not necessarily harmoniously, enfold one another, precisely in and through leakage or, as Gabrys has it, spills. Similar lines of thought are found in sociologist Hannah Landecker's (2019) work on manufacturing wastes as animal feed and the subsequent intake, not only of nutrients, but also of toxins and pollutants. Employing what Landecker refers to as the chemical gaze, it is noted that traces of heavy metals, endocrine disruptors, and antibiotics (all byproducts from the production of food commodities) are forwarded as bodies are connected across taxonomic boundaries.

As leakage leaves traces—pieces of information—through its linkage to other objects and bodies, it also emerges as an active, innate, but first and foremost unruly part of every attempt to enclose and contain, which suggests that there is an inherent resistance in leakage—in the movement itself. Leakage, then, changes and transforms, both in relation to social structures and its own material composition as well as to the particular logic that encompasses it; however, leakage also carries its own resistance in that it is involved in, and co-constituted by, different kinds of oppositional practices. It calls attention to the ways in which we tune our bodies to the world as well as to other bodies, both human and more-than-human. As such, leakage points towards the traces inherent to movement, as well as towards idea(l)s of containment and control. There is also an inertia to leakage, an absent presence (Pyythinen 2022) and an uncertainty that blurs, not only spatial borders, but also the past, present, and future, which is evident, particularly in relation to odours. Drawing on the work of sociologist Kevin Hetherington (2004), the smell of yesterday's fish in the refrigerator might linger on despite the fact that the fish has been discarded. This analogy tellingly shows that '[t]he erasure of an object is never complete. There is always a trace effect that is passed on by its absence' (Hetherington 2004, 168). Similarly, stains on chairs, contaminated soil, and raspberries growing close to landfills are all signs of past movements of different fluids. They point towards what once was (perhaps more than once) As a trace, and similar to waste, leakage thus reveals signs of previous deeds and actions at the same time as it calls attention to, and

upsets, current patterns of consumption and production. It is at once *stationary* in that it has a source (the leak) and *directional* in that it moves or is transported (that which leaks). With regards to the latter, leakage speaks to an elsewhere that does not allow for a simple transformation from one location to the other, from one status to another. Hence, while leakage demonstrates a sense of direction, it might do so in some sort of unpredictable manner. Seeping into, or out of, might comprise the distinction between loss and excess, the risky and the valuable. Leakage embodies all of these statuses as it shows up in places not expected and straddles individual bodies and infrastructural arrangements. Here, leakage shares with terms such as dirt (Douglas 2003), noise (Serres and Schehr 1983; Bijsterveld 2008; Williams 2013), and toxins (Liboiron et al. 2018) the disrespect for, and crossing of, borders.

However, as leakage upsets some boundaries, it also enables and sustains others (cf. Anand 2017, 188). As such, and similar to dirt (Douglas 2003) leakage is part of ordering practices at the same time as it points to, and materializes as disorderly and untamed. Regardless, leakage, it is suggested, serves as a means to demonstrate the impossibility of distancing ourselves from that which disturbs and upsets, particularly as it challenges the distinctions between mind/body, private/public, and human/nonhuman. In addition, as leakage concerns, both the symbolic and the material, the mundane and disturbing, the intercorporeal and the (infra)structural, the processual and the ritual, it speaks to connections, not only between bodies, but also amid scales.

The rest of this chapter outlines some of the ways in which leakage has been framed and analysed by gender theorists and discard studies scholars. Attention is thus given, both to the human body's inherent relationality and the inevitable intermingling of waste matter and environment. As such, the idea(l)s of containment and control are called into question, albeit from different perspectives.

Leakage as Shameful and Mundane

It was mentioned above that feminist theorists and discard studies scholars share an understanding of (human) bodies as inextricably part of the environment as well as more-than-humans. As a means to develop this thought, this section discusses yet another common denominator of the two tenets, that is, the psychoanalytical term *abject*. This term, developed and explored by philosopher Julia Kristeva (1982), was initially used to investigate an in-between state, a border object, if one may, that simultaneously assumes and upsets the subject and the object as distinct categories. As such, the abject has

been used in order to make sense, both of bodily fluids and waste respectively. Feminist theorists (cf. Butler 1993; Grosz 1994; Ahmed 2004; Young 2005, 2011) have shown that the abject emerges prior to the establishment of, and distinction between, subject and object, but that it is also that which makes this distinction possible. Here, the term is used, both as a means to explain reactions of disgust in relation to bodily discharges (Ahmed 2004; Young 2005, 2011), to understand the establishment of what is considered a proper social body and to challenge patriarchal notions of certain bodily fluids as something inherently dirty (Persdotter 2020, 2022).

Kristeva's notion of the abject has also been used among discard studies scholars to depict the stigma attached to waste as well as certain kinds of waste labour (cf. Moore 2012; Campkin & Cox 2012; Reddy 2015). Others have explicitly chosen not to use it. Gay Hawkins (2006) for instance, notes that while the term is indeed useful to elucidate the disgust and horror one can feel for waste, it says less about the kind of waste that we tend to manage on a daily basis, the refuse found in gutters and waste bins on the streets in cities. As such, Hawkins argues, the psychoanalytical approach provided by the term abject—at least according to Kristeva's reading—contributes little when it comes to making sense of how waste *de facto* is managed and treated on an everyday basis. Contemplating Hawkins' reasoning, I agree that while the term is, in many ways, useful to describe leakage, both in relation to involuntary bodily discharges and waste management practices, it says less when it comes to leakage as a common part of our everyday life. Hence, while this chapter pays attention to leakage as disruptive, shameful, and embarrassing, it is equally attracted to the routines and mundaneness that characterize many leak prevention practices, both in relation to waste management and the management of bodily discharges.

Both feminist theories and discard studies have, besides (not necessarily at the expense of) their usage of the term abject, highlighted the routinized and everyday practices of management, monitoring and prevention of leakages, be it through technologies such as bathrooms bins, pads, menstrual cups and washing machines or flow meters, video cameras, protective liners, samplers, and check valves. This approach enriches the understanding of leakage as accidental, shameful, and embarrassing with an insight into its mundaneness.

The mundaneness of leakages and leak prevention, mostly as it emerges and is enacted on organizational levels, has been depicted by discard studies scholars (cf. Reno 2011; Dobraszczyk 2012; Hird 2012, 2013). I mentioned above, Myra Hird's (2012, 2013) two accounts in which practices of landfilling emerge as continuous attempts of making sure that waste does not leak. While the empirical focus might differ from and between the other authors,

they reveal similar findings. Discard studies scholar Joshua Reno (2011), for instance, investigates the everyday work at a landfill of preventing (or at least monitoring) leakages of substances and odours from the landfill into adjacent neighbourhood areas. Similarly, Paul Dobraszczyk (2012) discusses the mapping of sewer spaces in mid-Victorian London as a means to sustain the idea of cleanliness, efficiency, and order. While maps might reveal contesting views, as was the case during this period, the ability to visualize and thereby control sanitary infrastructures gives the impression of a coherent system, freed from leakages and mishaps.

The above-mentioned works show that the prevention of leakages is part of ordinary, routinized waste management practices, enacted and seemingly accomplished on an everyday basis. As such, and as has been indicated above, waste management and its inherent instances of leakage rarely generates attention, unless of course they emerge as perceived nuisance or immediate threat to the environment or human health.

Similarly, from a feminist theoretical perspective, notes on the simultaneous ordinary everyday practices of managing bodily discharges, in particular menstruation, are often made together with accounts of feelings of dirt and shame (cf. Young 2005; MacDonald 2007; Bobel et al. 2020; Wood 2020; Persdotter 2022; Koskenniemi 2023). This means that the status of menstruation as dirty, stigmatized, and taboo (Persdotter 2022) emerges and is negotiated parallel to its status as part of everyday pursuits and the living-with. Put differently, that which disgusts and appalls might at the same time be part of mundane, and much routinized, work. The fear of losing control, of causing embarrassment then (in itself a highly embodied phenomenon), results in routine (and institutionalized) leak detection, and prevention practices, as well as in continuous practices of monitoring and surveilling, all pursued with the awareness that it is a never-ending enterprise.

A joint reading of feminist theories and discard studies suggests that leakage embraces both the shameful and the mundane. It might be disturbing, embarrassing, and sometimes of spectacular character, but it might also pass as a normalized, expected, and most regular occurrence—yet another task and far from being repulsive and destabilizing. It is noteworthy that while the everydayness of leak prevention practices seems rather distant from feelings of disgust and shame, it is important to remember that the former also relates to control and domination. Routinized practices of monitoring, measuring, and surveilling of leakage, then, are key to control and domination. For example, to settle on certain standards, thresholds, and designated spaces for (what is considered to be acceptable levels of) leakage is also to assume control over this leakage.

Leakage and Waste: On the Infrastructural

This section briefly outlines recent works within discard studies, where focus is on waste, waste management, and leakages such as pollution of toxic and non-toxic substances, but also on the waste infrastructures that render intelligible leaks and spills (cf. [van Wyck 2005](#); [Gabrys 2009](#); [Hird 2012, 2013](#); [Anand, 2017](#)). While these works do not seek to dissect leakage in particular, they nonetheless use the term to explore contemporary practices of waste management, both engineered solutions such as landfills, sewers, and storage for nuclear waste and organic assemblages such as carbon sinks. This implies, as also mentioned above, a strong correlation between waste management and the prevention of leakage. This section adds to the brief outline of Hird's (2012, 2013) works (as discussed above), an understanding of waste infrastructures as one particular logic within which monitoring and prevention of leakage occur. Take landfills for example, whose permeability and unsettledness upset any attempt to ultimately enclose and contain:

A municipal solid waste (MSW) landfill is not a benign repository of discarded material; it is a biochemically active unit where toxic substances are leached or created from combinations of non-toxic precursors and gradually released into the surrounding environment over a period of decades. ([Papadopoulou et al. 2007](#), 43)

As landfills are seen as porous and continuously fluctuating mishmashes of toxic and non-toxic substances that seep into and affect the surroundings, it is clear that waste is never fully contained or controlled, precisely because of its ability to leak. This is also the case in relation to the work of Peter [van Wyck \(2005\)](#), whose depiction of the underground disposal facility for nuclear waste in the desert of Carlsbad, New Mexico, strikingly shows the immanent risk of leakages as well as the vast temporal registers to account for when planning for the prevention of these risks. Also, returning to Gabrys' account of carbon sinks, she explains that '[t]he stowing away of wastes never proves to be a permanent solution' (2009, 671). Gabrys uses the term spill to challenge our understanding of sinks, that is oceans and lakes as well as soil and vegetation that absorb and store greenhouse emissions. Sinks do not form a metabolic process of waste management in which emissions are localized, absorbed, and rendered harmless (only to be presented) in linear and predictable orders. Rather, and similar to landfills, sinks are part of the co-creation of hybrid ecologies. Nikhil [Anand \(2017\)](#) also acknowledges sanitary infrastructures as mishmashes of both humans and

more-than-humans, in which provision of water and removal of waste water occurs next to continuous leaks and spills. As such, sanitary infrastructures are fraught with controversies in that their status as working and functional cannot be wrested apart from breakdowns and slippages.

The above-mentioned works speak to the potential movements of waste, also in terms of its contagious nature. Rather than being contagious *per se*, waste emerges as *potentially* contagious, precisely because of its ability to leak. The potentially contagious nature of waste, then, is actualized in and through, for instance, leachate. As the focus of the above-mentioned works is waste infrastructures, leakage emerges as waste at its most animate and vital points as containment and accumulation fail. Leakage, then, is the persistent reminder of the traces inherent in waste. These works also allow for a conceptual understanding of leakage as complementary to waste. This means that once-and-for-all solutions regarding the containment of waste are impossible. Substances from landfills continuously leach into the surrounding environment, nuclear waste resists containment, and toxins seep into and through sinks. Leakage, then, actively co-creates its own movements; whatever leaks is also transformed into waste:

Spills are a way to describe the movement and exchange of wastes that do not conform to a clear trajectory or network, but, rather, express more formless and even disruptive geographies. (Gabrys 2009, 666)

This quotation points towards the impossibility of separating leakage from practices of containment and enclosure. As hinted above, leakages, spills, pollutants, and contaminants are routinely subsumed according to different forms of measurability, scalability, and manageability. To pass as acceptable, they have to comply with different limits, thresholds, and exposure rates, and this as a means to render them intelligible, representative. Once rendered intelligible, different kinds of measures are initiated (and legitimized). At the same time, investigating the infrastructuralization of waste management (including the prevention of leakages), it becomes evident that the establishment and maintenance of waste infrastructures such as landfills, sewers, or nuclear repositories are intimately linked to, and gain meaning in relation to, the disorderly and unruly.

That said, while the above-mentioned works focus on the materiality of waste, as well as on the transfer of toxic and non-toxic substances and emissions, others have highlighted the contagious nature of waste in relation to the social stigma attached, particularly to people engaging in informal—albeit no less infrastructural—practices of waste management (cf. Beall 1997;

Bauman 2004; Millar 2018; Min'an 2011; Morrison 2015; Omokaro 2018). The contagious nature of waste, then, is a most material phenomenon at the same time as it emerges as deeply symbolic (Douglas 2003) in that those picking up garbage and left-overs are commonly regarded as impure. As such, there is a negotiation in relation to leakage, spill, pollutants, and contaminants that includes both material and symbolic practices. This is further elaborated on below and then in relation to corporeality.

Leakage and Menstruation: On the Intercorporeal

Having explored leakage in relation to waste infrastructures, I turn in this section to leakage with regards to corporeality, drawing particularly on Mary Douglas's (2003) classic account of the cultural notion of dirt and the rituals surrounding hygiene and impurity. Here, dirt and corporeality comprise deeply intertwined phenomena, the body being the centre for symbolic impurity. Douglas (2003) uses excerpts from the Old Testament to show how idea(l)s of the sacred materialize in terms of an embodied whole, something that implies a detachment from, and removal of bodily discharges such as menstruation and fluids from childbirth, but also blood from corpses.

Many of the more recent feminist scholars who draw on the work of Douglas also critically explore leakage in order to understand bodies, in particular the female body (cf. Grosz 1994; Shildrick 1997; MacDonald 2007; Bobel et al. 2020). Grosz, for example, notes that 'there remains a broadly common coding of the female body as a body which leaks [...]' (1994, 204). In a similar vein, gender theorist Linn Sandberg mentions the 'leakiness, mushiness and lack of boundaries [as] strong prevalent symbolic representations of female bodies' (2011, 137). Similar findings are presented by Gail Kern Paster (1993) in her study on representations of the body in Renaissance English theatre, where Paster concludes that the normative condition of women in early modern Europe was to leak. Together, the studies by Paster (1993), Grosz (1994), and Sandberg (2011) demonstrate that the assumed leakiness of the female body is far from a recent phenomenon and that it cannot be excused as a mere relic of the past.

That said, it is noteworthy that leakage is not just another property of a predefined female body (in the singular). Bodies also become gendered *because* they leak, in ways similar to how their status as gendered is the result of frequenting certain spaces and not others. Leakages and bodies are thus mutually constitutive in that leakage is both a gendered and a gendering force; its inherent agency challenges and cements gender dualisms, as well as

women's social subordination to men. Leakage as gendered and politicized is further discussed by Grosz who notes that some body fluids are wanted and welcomed, but others are not: 'Blood, vomit, saliva, phlegm, pus, sweat, tears, menstrual blood, seminal fluids, seep, flow, pass with different degrees of control' (1994, 195). Hence, whereas tears might be acceptable and sometimes even anticipated, menstrual blood and urine indicate failed control, embarrassment, and shame. In line with Grosz's (1994) line of argumentation (and informed by the work of Turner C. Steckline), MacDonald adds speed as yet another factor that might determine the status of body fluids:

[S]pitting, an active expulsion of saliva, is at least somewhat socially acceptable or even expected, particularly among men. However, 'drooling, as a rule, seems to indicate a lack of control, a surplus of saliva, illness or disease'. (2007, 348)

This quotation points towards social acceptance as (also) being tied to the intentional and planned. Whatever is not actively discharged, or that which accidentally seeps out, seems to indicate a lack of control, and as such, it clearly breaks towards social orders.

Thus far, as leakage seems to relate to the female body, it remains not only an intimate matter but also largely individualized. Here, the individual woman is responsible for potential leakages, something that is specifically the case in relation to menstruation where women often engage in a sort of self-surveillance in order to (re)present a normative body, freed from leaks and dirt. Gender theorist Jill M. Wood (2020) refers to these practices as part of what she denotes as the menstrual concealment imperative, and draws on Foucault's work on discourse and biopower to investigate how women are simultaneously exposed to, and actively part of, reproducing their own subjugation as the non-menstruating, non-leaking, and non-smelling body is reproduced as the ideal. Against this backdrop, it is not surprising that leaks are framed almost exclusively in terms of social discomfort and embarrassment (MacDonald 2007; Koskeniemi 2023). Here, the body, and particularly the female body, does not seem to be exposed to leakage; instead, it generates/constitutes leakage (Olofsson 2023). Since menstruation is described in terms of leakage, the most important task for women (as individually responsible) seems to be to eliminate the risk of leakage in order to hide the fact that they are menstruating. The embarrassment of leaking that is implied in the efforts to hide and conceal menstruation often personifies leakage in terms of the *I*, and the embarrassment of leaking thereby also becomes embarrassment with oneself.

Privatization and Publicization

Thus far, this chapter has shown that the socio-material control of leakages differs depending on the logics of which it comprises part. Again, whereas leakage, as it is discussed in relation to waste management practices, comprises something that humans (and the environment) are *exposed to*, feminist scholars critically investigate how the body, and particularly the female body, *generates/constitutes* leakage. This section augments this reasoning as it highlights the privatization and publicization of leakage that are implied in these logics. Leakage then, speaks at the same time to the intercorporeal and the infrastructural as it traverses, straddles, and upsets the distinction between the public and the private, the collective and the intimate.

As mentioned above, feminist theories and discard studies alike acknowledge leakage as at once shameful and part of mundane work. From the perspectives of discard studies however, it is noted that the publicization of leakage tends to make it easier to manage. For instance, as sanitary infrastructures transform individuals' shit to everyone's (and no one's) waste water, they also effectively protect us from ourselves. The infrastructuralization of waste management and the subsequent publicization of mishaps, such as breakdowns and leakages, are mentioned by the philosopher John Scanlan who notes that 'specialist production and public bureaucracy ensures that we are already one step removed from the consequences of our own waste in that we never see it' (2005, 127). Hence, chances are high that we (at least in the Western world) are not faced with the full effects of garbage, precisely because our personal involvement in practices of disposal is limited to/replaced by municipal standards and techniques. Infrastructures thus serve as means of alienation. That said, infrastructures do not only distance us from our individual discharges; recent works within discard studies show that they also contribute to straddling the public and private. Here, psychoanalyst Dominique Laporte's (2000 [1979]) book *History of Shit* deserves particular mention. Investigating the development of sanitary systems in Western Europe during the sixteenth century and onwards, Laporte (2000) shows the intimate link between this development and the formation of individualism. Not only do toilets and sanitary systems transform faeces from private to public matter; they also cause faeces to disappear as such. Shit, Laporte stresses, 'ceases to be shit once it has been collected and transmuted' (2000, 66). Put differently, as a highly private matter, shit needs to become public in order to be managed. Hence, at the same time as bodily discharges are to be hidden from public scrutiny, sewer systems are material

manifestations of modernity's effectiveness when it comes to garbage removal (Bauman 2004). Reassuring the public that bodily discharges are safely being transported, managed, and removed, sanitary infrastructures thus show the intricacy between public concerns and private, intimate matters while simultaneously fostering the impression of a neat and effective separation between ourselves and our bodily discharges.

Drawing on the work of Laporte (2000), Hawkins (2006) also investigates sewer systems as mediators (rather than as means of alienation) between the public and private. In doing so, she points towards the relation (or perhaps more adequately, the inevitable tension) between the private production and public management of bodily discharges. Infrastructures for managing bodily discharges, Hawkins notes, do more than moving shit from the private to the public sphere; they also turn potential problems of contaminated beaches and bad smell into the failure of the state. As such, '[t]he infrastructural logic of sanitation is not just technical but cultural' (Hawkins 2006, 46f). Paradoxically then, the privatization of defecation and urination—architecturalized perhaps most evidently in terms of bathrooms and toilets, but also miles of sewers—is fundamental, not only to distancing ourselves from our bodily discharges, but also to the objectification, institutionalization, and depoliticization of waste management, whereby the management of bodily discharges turns into the responsibility of the state. Conversely, it is in and through the process of making shit individual or private that it also emerges as a political object, as a matter of concern to paraphrase Latour (2004). Insofar as sanitary infrastructures remain functional then, they equally serve to depoliticize and render invisible human discharges. That said, and recalling that waste infrastructures' status as working and functional cannot be wrested apart from their intrinsic instances of breakdowns and slippages, attempts to depoliticize and render invisible are a temporal, and most rickety, achievement. For inherent in leakage is the want for an elsewhere, and herein also lies its potential and transformative power.

Conclusion

This chapter has offered a critique of the ideas of containment that follow human attempts to manage waste, be it in relation to bodies, carbon sinks, sewer pipes, or landfills. As such, it has explored leakage as it has been the object of scrutiny from feminist theorists and discard studies scholars alike. Drawing on recent works within these two disciplines, where focus is on

corporeality and waste management infrastructures respectively, leakage is embodied and earthed, moved and transported, lived and institutionalized, but according to different logics and in dialogue with different monitoring practices. At the same time, this chapter has revealed connections and similarities between these logics, in particular the idea(l)s of containment and control. This in turn has facilitated an understanding of leakage as productive and relational, but first and foremost as a trace-making practice.

Leakage demonstrates both the human body's inherent relationality as well as the inevitable intermingling of waste matter and environment. As such, it upsets waste management practices and challenges patriarchal notions of what comprises a proper body. Moreover, while not always actualized, leakage as an omnipresent potentiality renders it present, both in relation to the intercorporeal and the infrastructural, as it silently looms over every attempt to enclose, contain, and accumulate. For inherent in leakage is its relation to other objects and bodies; rather than being the property of a preexisting thing, the essence of leakage is rooted in relationships, not always wanted or appreciated. While Western ways of thinking often teach us that waste infrastructures are by and large impermeable, that bodies ideally should not leave any traces and that leakages are accidental mishaps, this chapter has suggested that leakage is both relational and productive. Herein lies its transformative potential.

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From Thin to Thick Relationships with Objects

Constituting Subjectivity through Consumer-Object Folds

Taru Lehtokunnas and Elina Närvänen

Introduction

If we take a look at current consumption practices in affluent societies through the lens of waste, one of the first thoughts that probably comes to mind is that something needs to change. During the twentieth century, consumption objects started to become easily available and also easily disposable (Strasser 1999; Valkonen et al. 2019), and this development of the so-called consumerist societies has led to the production of massive amounts of waste. In Finland, where the writers of this chapter are based, 3.3 million tonnes of municipal waste were produced in the year 2021 (Statistics Finland 2022). This amount includes both household waste and waste produced in industries that relate closely to consumption practices, such as retailing. The need to curb our wasteful and destructive consumption practices has given rise to multiple different attempts and ideas that aim to change the way we consume and waste. Ideas such as ‘ethical consumption’ or ‘sustainable consumption’, among others, aim to respond to this need to change unsustainable consumption practices. However, regardless of the various attempts to reduce waste, it remains an inescapable fact that all waste cannot be prevented since consumption will always produce waste and thus, consumption practices are tightly connected to waste practices.

There is a growing body of research that focuses on dealing with consumption objects and waste in everyday practices (see e.g., Hetherington 2004; Gregson 2007; Evans 2012; Koskinen et al. 2018; Lehtokunnas et al. 2022). These contributions examine how people order practices of disposal and wasting in their everyday lives (Hetherington 2004; Gregson 2007; Evans 2012) and what kind of affective and ethical considerations waste practices

entail (Koskinen et al. 2018; Lehtokunnas et al. 2022). However, it is not often clearly articulated in scholarly or public discussions concerning consumption and waste that different consumption objects turn into waste through very different processes, and this strongly shapes both our relationships with these objects and our subjectivity as consumers.

By leaning on Gay Hawkins' (2013, 56) notion that waste has performative capabilities to provoke action and shape our subjectivity, this chapter aims to examine how the different wasteness of consumption objects shapes both our subjectivity as consumers and the relationships we form with objects. In our analysis, we want to show how what we term 'the wasteness' of objects does not come to be only through acts of disposing and excluding unwanted things but is rather always present in objects. We argue that this constant presence or virtual (Deleuze 1966, 1968) wasteness affects consumer subjectivity even before objects turn into waste. Our analysis focuses on three different examples: shopping and handling of bananas, using smartphones, and recycling used armchairs. Thinking with these examples, we want to highlight the notion that in order to change consumption practices and prevent objects from becoming waste, it is important to better understand the dynamics between consumers and the different wastenesses of objects. By doing this, this chapter contributes to both consumer studies (see e.g., Brosius et al. 2013; Koskinen et al. 2018; Gollnhofer et al. 2019; Godfrey et al. 2022; Lehtokunnas et al. 2022) and social scientific waste studies (see e.g., Gregson 2007; Hawkins 2013; Valkonen et al. 2019).

The chapter is organized as follows: first, we will discuss previous consumer studies that examine consumer–object relationships and waste. Then, we will explore the concepts of fold and virtuality. After this, we will analyse the formation of subjectivity by discussing the consumption of bananas, smartphones, and used armchairs. Finally, we will draw conclusions.

On Waste and Relationships with Consumption Objects

During the past twenty years or so, social scientific waste researchers have highlighted how important and even urgent it is to pay attention to disposal and waste when studying consumption (see e.g., Hetherington 2004). When discussing consumption in an affluent society context, currently it is indeed impossible to ignore the massive amounts of waste produced as a result of consumption. Although it is clear that consumers in affluent societies have to change current patterns of consumption, social scientific waste

studies find that blaming individual consumers alone simplifies the scale of the problem and ignores the everyday socio-material processes that lead to waste production (Evans 2012). Thus, our aim in this chapter is not to judge whether consumption practices that contribute to waste production are morally reprehensible, but rather to focus on how the ‘wasteness’ of objects shapes consumer subjectivity and the relationships between consumers and consumption objects.

Consumer research, drawing from anthropology and material culture studies investigates the relationships between people and the objects they own and use. Such studies establish objects as carriers and mediators of meaning (Douglas and Isherwood 1974), and as such objects have biographies and social lives of their own (Appadurai 1986; Kopytoff 1986). For instance, the imagined and real histories of old objects often shape consumers’ relationships with them (Abdelrahman et al. 2020), highlighting the capability of objects to shape and affect their users and owners (Borgerson 2013). From the perspective of material culture, person–object relationships are dialectical (Miller 2010). For instance, the way a kitchen table or a television organizes family identity practices (Epp and Price 2010; Chitakunye and Maclaran 2014), a music cassette carries affects and emotions from one owner to another (Kuruoglu and Ger 2014), or how the body of a consumer interacts with the mundane consumption object of a bed (Valtonen and Närvänen 2015) have been studied.

There is a less established yet growing body of consumer research on waste that often highlights the consumer as an active agent in relation to waste. For instance, Gollnhofer et al. (2019) analyse the way dumpster-divers and food sharing networks create alternative pathways for food waste by cleaning, sorting, cooking, and circulating surplus food. Brosius et al. (2013) show how engaging in practices of scavenging and collecting inorganic waste objects makes people more conscious of the amount of waste produced in society, and thus more motivated to act sustainably. The possibility to re-integrate repairing into consumption practices both at the level of individuals and society more broadly is theorized as a potential way to support sustainable consumption (Godfrey et al. 2022). However, this requires more attention be paid to the fragility of consumption objects and their capacities within consumption practices.

Because waste is a fluid category that can be assigned to a consumer object in processes of devaluation, divestment, and disposal (Evans 2019), waste has perhaps escaped attention in studies of consumer–object relations. Studies on consumer–object relations typically concentrate on processes of acquisition, appropriation, and appreciation (Evans 2019). Furthermore, waste has

remained a passive target of consumer action rather than an active part of a dialectical relationship with consumers. What this literature is still missing, we argue, is a consideration of the constitution of consumer subjectivities through waste.

Folds, Consumer Subjectivity, and the Virtual Wasteness of Objects

In this chapter, we focus on the constitution of different folds with objects to analyse the formation of consumer subjectivity and the relationships between consumers and objects. Deleuze developed the concept of fold, drawing from Michel Foucault's conception on subjectivity (Deleuze and Strauss 1991; O'Sullivan 2010). For Deleuze, the fold means one's relation to oneself that is constituted through a process of becoming—a process in which the outside (e.g., discourse or material environment) is folded with the inside (e.g., subjectivity or the self) (Malins 2004). The fold is often illustrated with the metaphor of a handkerchief, after Serres and Latour (1995). Referring to John Allen (2011, 285), Hervé Corvellec et al. (2018, 57) describe the idea of the fold as follows: 'where the flat, well-ironed surfaces of a handkerchief stand in for fixed distances and well-defined proximities, the fabric, when folded, draws together weaves of cloth previously held apart so that points previously at separate ends of the handkerchief are now in contact'.

The metaphor of the handkerchief illustrates how the fold draws interiors and exteriors together. Drawing from this metaphor, we especially focus on how the different wasteness of objects shapes the layers of folds. The ways these layers are formed (or not formed) both shape consumer subjectivity and contribute to creating the relationships between consumers and objects that may be thick or thin. With thick relationships, we refer to caring dimensions of dealing with objects that is 'collaborative and continuing attempts to attune knowledge and technologies' (Mol 2008, i) to maintain the objects and prevent their virtual wasteness from actualizing. This process makes the relationships between consumers and objects more active. The thickness of relationships thus refers to the multiple layers of the fold that are formed through an active relationship with the object. With thin relationships, we then refer to less active or even passive relationships with objects that may result from a certain kind of wasteness of the object itself. When the relationship between the consumer and the object is passive, the layers of the fold remain thin.

When analysing the wasteness of objects and the way it contributes to creating thin or thick relationships, we draw from the concept of *virtuality* (Deleuze 1966, 1968). With *virtuality*, Deleuze (1966, 1968) refers to qualities that are present in an object, but which have not *actualized*, that is, they are not figured in the object at the present moment. If these qualities become figured, they actualize. Virtuality does not, however, mean that the quality that is not figured in the object is not real—it is always present and real, but it will become visible only through the process of actualization.¹ Thus, the concepts ‘virtual’/‘actual’ are closely related with each other and probably best understood when presented together. Virtual wasteness is present in all objects since all objects will turn into waste at some point. For example, an edible banana has wasteness as a virtual quality within it, and this wasteness actualizes when it turns brown, soft, and slimy. In the following three sections, we will examine how the virtual wasteness of bananas, smartphones, and used armchairs shape the relationships between consumers and objects. We show how these different virtual wastenesses of objects contribute (or do not contribute) to enacting new layers to folds, thus making the relationships between consumers and the objects either thicker or thinner.

Bananas: The Virtual Wasteness of a Perishable Food Item

In this section, we analyse the ways in which the virtual wasteness of bananas shapes folds. When considering bananas in terms of the Deleuzian fold, we are interested in the layers created when consumers handle perishable food products in their everyday consumption practices. Here, we focus especially on the strategies that everyday consumption practices entail to manage the virtual wasteness of bananas. In addition, we show how waste entangled with the object in production and retail phases shapes both the fold and consumer subjectivity.

If we think about acquiring bananas, it seems clear that it would not be possible to buy bananas in a supermarket without the waste produced in the process of production and distribution. In the production stage, enormous

¹ Virtuality should not, however, be mixed with the concept of potential. According to Deleuze, the idea of virtuality differs from the concept of *potential* since potential becomes real only through two kinds of negations (Lehtonen 2000): first, potential is something that has not been realized and that is thus opposite to real, while virtual is always real, even if it is not visible. Second, a focus on one potential always forces one to neglect other potentials since only one potential can realize. Virtual, however, does not come to exist through these kinds of static negations, but it is rather a dynamic bundle of different qualities that are present in an object.

masses of bananas end up as waste as a result of the fact that all produced bananas do not meet the quality criteria (Alzate Acevedo et al. 2021). Further, in supermarkets, to create an inviting shopping environment with good product availability and full shelves, it is necessary to always order slightly too many products, and as a result of this, some products always end up as waste (Lehtokunnas and Pyyhtinen 2022). In this sense, the banana we buy from the supermarket is always much more than the object we are able to observe in a certain moment. Thus, when managing the virtual wasteness of bananas, consumers are not only responsible for dealing with the tendency of bananas to turn into waste after purchasing them, but they are also expected to work on themselves (Foucault 1994) for the purpose of preventing the waste that occurs before the purchase (Lehtokunnas et al. 2022). For instance, the promotion of 'single bananas' has become a popular technique for retail stores to appeal to consumers' responsibility while choosing which bananas to buy at the store. In this way, the waste that has occurred before purchasing bananas may contribute to creating a layer to the fold and thus shaping consumer subjectivity since some consumers may even refuse to buy bananas because of the ethical issues in the global supply chain. Here, the avoidance of consuming certain objects paradoxically implies a thick and caring relationship between the consumer and the object when the consumer actively acquires information about the production process of a certain object and, based on this information, changes their behaviour.

Further, in addition to the notion that consumers have to care for producer and retail waste, the fold with bananas also entails practices of managing the virtual wasteness of bananas in everyday practices at home. As bananas are quite perishable, consuming them often also means preventing them from turning into waste. There are many strategies to prevent the virtual wasteness of food from actualizing in everyday practices. For instance, Mattila et al. (2019) identify how frontrunner consumers reduce their food waste through practice bundles of scheduling, pausing, stretching, and synchronizing—all related to managing the temporality of food and preventing it from turning into waste. In the case of bananas, these strategies relate to, for example, following the different phases of maturation of the fruit, protecting the banana from squashing and bruising, planning the usage of the bananas, and knowing how to save the banana if these strategies fail. For example, if you want to take a banana with you to work, you can protect it from turning into waste by placing it in a banana-shaped storage box and tucking it into your backpack, which is a strategy designed to make it easier to fold the preservation of the banana into everyday life. Planning the usage of bananas also relates to buying a suitable number of bananas so that they will all be used before

they spoil. If these strategies fail, however, one can freeze the bananas, or if they have turned completely brown and soft, they can be used in cooking banana bread or oatmeal. Dealing with the virtual wasteness of a banana also requires knowing the time-window within which a green, yellow, or brown-dotted banana has to be used. This time-window can also be prolonged or shortened through modifying the physical distances between the banana and other fruits. If you, for example, put a banana next to an avocado, both fruits will start to ripen quickly due to the combined amount of ethylene gas they produce.

These examples show that if we truly engage in practices that aim to prevent the actualization of the virtual wasteness of a banana, our relationship with the banana easily becomes very active. This adds multiple layers to the fold. These layers entail know-how, scheduling, and management of different technologies, among other techniques. Thus, forming a thick relationship with a banana is strongly related to the fact that there are multiple possibilities to actively affect the process by which the banana turns into waste. In this sense, the virtual wasteness of a banana supports the constitution of consumer subjectivity.

Of course, consumers are not always able to engage in practices of maintaining bananas as conscientiously as in the examples previously discussed. In some cases, we as consumers may buy bananas without much consideration and later notice that we have neither time nor willingness to eat them. Previous studies have shown that in some cases, consumers know from the moment of purchase that they are not going to eat a certain food product, but since it is not morally acceptable to dispose of edible food, they can, for example, store surplus food in the fridge and wait until it is spoiled before disposing of it (Evans 2012). In the practice of ‘forgetting’ bananas until they are spoiled, we enact a distance to the consumption object to make our relationship with it thinner. Here, the relationship with the object is much less active than in the examples of working to prevent the virtual wasteness of the banana from actualizing. In a sense, however, the act of ‘forgetting’ the banana creates a layer to the fold, but the relationship still remains passive and thin. Moreover, the act of ‘forgetting’ is also part of forming consumer subjectivity: the virtual wasteness of the banana has to be actualized before we have a moral right to cut off our relationship with the object.

As the examples discussed in this section show, the virtual wasteness of bananas affects consumer subjectivity from the moment consumers make choices about whether to purchase bananas. As we pointed out, actualizing a banana as a consumption object would not be possible without producing waste in the production and distribution stage. Because of these issues in

the production and distribution of bananas, some consumers may not want to buy bananas. Here, refusing to purchase bananas paradoxically implies a thick and caring relationship between the consumer and the banana. In this sense, acquiring knowledge and changing behaviour based on this knowledge shapes consumer subjectivity in relation to bananas. We also explored how consumers deal with bananas and their virtual wasteness in everyday consumption practices at home. As preventing bananas from turning into waste requires a lot of maintenance and care, the relationship with bananas easily becomes very active. Here, the virtual wasteness of bananas as easily perishable food items can contribute to making the relationship between bananas and consumers thicker. In this sense, the virtual wasteness of bananas is not simply a negative quality, but one that can enable multiple possibilities of forming subjectivity in relation to the object. However, sometimes consumers may not have the time or willingness to maintain bananas they have purchased, and in these cases, the virtual wasteness of the banana has to actualize before one has a moral right to dispose of it. Here, the act of ‘forgetting’ to eat the banana creates a necessary layer to the fold, making it possible to form consumer subjectivity. In the next section, we will discuss the example of smartphones.

Smartphones: The Virtual Wasteness of a Digital Companion

This section examines folds with smartphones. In a sense, the physical and emotional distance we form with our smartphones is often rather intimate. They are even conceptualized as our digital companions, with whom we may have a close relationship characterized by trust, preoccupation, and meaning (Carolus et al. 2019). At the same time, however, consumers have limited opportunities to manage the virtual wasteness of a smartphone, as we will show in this section. A smartphone, like every ‘new and shiny object of our age’, eventually becomes a ‘rusting, splintered, discarded husk’ as Thill (2015) has imaginatively argued. Indeed, waste can be thought of as ‘every object, plus time’ (Thill 2015). Smartphones represent a particular challenge because they are made of precious and rare earth materials, contain a risk of toxicity for human health and the environment, and suffer from a low circulation rate and increasing waste levels (Islam et al. 2021). Thus, in this section, we contrast the helplessness of consumers in relation to the process by which digital devices turn into waste with the intimate relationships they have with

their phones. We also highlight how this may contribute to forming thinner relationships between consumers and consumption objects.

As we previously noted, our relationship with our smartphones is often very active and this strongly shapes the fold we have with our phones. Most people take their phones everywhere they go and use them when sitting on the toilet, eating breakfast, and before falling asleep. Our concrete, physical distance to these objects is thus usually very short, but at the same time, these objects enable us to maintain connections with other people at longer distances. What is more, smartphones are an important part of forming subjectivity for many people: in addition to the fact that it is almost necessary these days to own a smartphone to be able to take care of everyday issues such as financial matters, many people, for example, take care of themselves by tracking their daily activities with their smartphone through different applications by which a consumer can monitor their mood and wellbeing. In this sense, the smartphone enables us to form a relationship with ourselves, and this makes our relationship with the phone active and intimate. Moreover, somewhat similarly as when packing a banana into a banana storage box, we also ‘dress’ our phones in a case, and some people will even have several cases for their one phone.

Regardless of our active relationship with our smartphones, and unlike our relationship with bananas discussed in the previous section, consumers have rather limited opportunities to affect how and when their smartphones turn into waste (putting aside attempts of protecting the phone from wear and damage). Producers usually stop promoting updates for the software at some point, so eventually the phone will turn into an information security risk, or it will stop working properly. Moreover, the software updates can be so extensive that they can no longer be installed on the phone (this may be the case especially with older phones). The manufacturers of electronic devices also use planned obsolescence as a marketing strategy to invite consumers to buy new products. Sometimes the perceived obsolescence of the product may be caused by malfunction and deteriorating battery life (Islam et al. 2021). This certain kind of virtual wasteness of the smartphone leads to a limited opportunity to affect the process by which the wasteness of the phone actualizes. In this sense, although our relationship with our smartphones is often active, the virtual wasteness of the phone limits consumer subjectivity and prevents new layers from forming to the fold. Thus, the virtual wasteness of smartphones is very different compared to that of bananas. While with bananas, there were several different opportunities to avoid the

actualization of its wasteness, with smartphones this actualization seems inevitable.

Further, the fold with a smartphone is so intimate and the phone entails so much personal information that it affects the disposal of the phone. When disposing of a smartphone, we have to cut off the relationship we once had with the phone and thus unfold the fold: we may have to sort the photos we want to save from the superfluous stuff saved that is also in the photo gallery of the phone (memes and so on) and delete all our personal data. Thus, we cannot just simply exclude the unwanted object; we also have to disconnect ourselves and our information from it—we have to divest it of the value it has accumulated (Evans 2019). In the worst case, the problems resulting from a failure in deconstructing the intimacy with the phone may be rather sizable if our personal information ends up in the wrong hands. Thus, research proves that for many consumers, retaining the electronic waste in their homes, in drawers and on shelves, is typical as people feel that by hanging onto their old phones, they are able to control the privacy risk (Islam et al. 2021)—an action which enables excluding the object while avoiding effort.

As the examples discussed in this section show, in the fold with smartphones, an intimate and thick relationship with the object is first enacted through active interaction. The phone contributes to the subjectivity of the consumer when the consumer personalizes it through apps, photos, contact details, and diverse traces of their digital life. A smartphone can be perceived as an extension of the self to which consumers become attached in an emotional way, even experiencing separation distress (Sohn et al. 2021). However, consumers have limited opportunities to affect the process by which the virtual wasteness of the smartphone actualizes because producers affect this process through, for example, ceasing to provide updates for the software. The manufacturers have an incentive to sell novel products, which is why the current disposal, recycling, and repairing services for smartphones are underdeveloped (Islam et al. 2021). While in the fold with bananas the wasteness always present in the object has a potential to make the relationship between consumers and bananas thicker, in the case of smartphones, the limited opportunity to affect the way the virtual wasteness of the object will actualize acts in exactly the opposite way and makes the relationship thinner (although the relationship with the phone is a much longer one than the relationship with a banana). Thus, in both cases, the virtual wasteness of objects clearly shapes consumer subjectivity, but does so

quite differently (see also [Hawkins 2013](#)). What is more, the intimate relationship one has with the smartphone has to be carefully cut off when the phone turns into waste. In the following section, we will discuss the example of recycling used armchairs.

Used Armchairs: The Virtual Wasteness of a Recycled Item

In this final section of our analysis, we explore consumer relations with used armchairs and discuss how the formation of folds is not only about an individualistic process of forming consumer subjectivity. Rather, we highlight how folding can also happen through creating a collective understanding of the relationships between consumers and the objects of consumption. When considering the virtual wasteness of used armchairs and the subjectivity it provokes (see also [Hawkins 2013](#)), we are especially interested in how dealing with the virtual wasteness of used armchairs requires separating the wanted (the armchair) from the unwanted (e.g., mould and pests), and how different human and more-than-human actors collectively participate in forming the fold and shaping the virtual wasteness of the armchair. Further, we also discuss how repair practices and the shared caring relations involved when circulating used armchairs through online platforms make relationships between consumers and used armchairs more active and thus thicker. By doing this, this section highlights how the thickness or thinness of the relationships between consumption objects and consumers is not simply a result of an individual consumer's actions or considerations, but rather formed through mutually shared processes.

Used armchairs can be acquired from physical or online flea markets and through different platforms in which they can be recycled for free (e.g., Facebook groups). When obtaining used furniture through these kinds of platforms, separating the desired items from the undesired ones is central. In addition to carrying stories and associations of past users ([Abdelrahman et al. 2020](#)), a used armchair also has physical connections with other people, materials, and potentially non-human animals. When making decisions about whether to purchase a certain item, consumers take these different foldings into account. Would it be possible, for example, that there is mould or pests in an armchair we buy, or could animal hair that has become stuck in it cause allergic reactions to someone in our household? If such issues occur, the virtual wasteness of the armchair will actualize, and it may potentially cause even more waste as it infects other objects in the household.

In the worst case, clearing the problems caused by purchasing used furniture may require pest control. These connections create extra layers to the fold and require managing. In this sense, discerning the past of a used armchair and checking the armchair itself to ensure that it is not infested with pests has potential to make the relationship with the object thicker and more active.

Moreover, when acquiring used armchairs, we often have to be ready to perform small or large repair practices, such as fixing a leg or upholstering the chair. In so doing, our relationship with the object becomes more active, as we have to plan and devote time to it instead of just buying a new one. However, repairing furniture is also an ongoing process (Godfrey et al. 2022)—if we want the piece of furniture to last, we often need to regularly care for it, and this may make the relationship between consumers and consumption objects more intimate. This kind of regular care adds layers to the fold and thus leads to the formation of thicker relationships between consumers and objects, as well as to novel relations through the creativity required for repair or curatorial practices (Abdelrahman et al. 2020; Meißner 2021). In this sense, the virtual wasteness of a used armchair enables a much more active relationship between the consumer and the object in comparison to smartphones (which cannot be repaired unless by professionals, if at all). At the same time, however, this need for care and repair can also prevent the relationship from forming at all, as it can create unwillingness to acquire used armchairs or other furniture, given their maintenance requirements (see also Godfrey et al. 2022). Moreover, the price of the object may also affect the willingness to maintain it, as a trendy vintage design armchair may cost thousands of euros, while some used armchairs may be very cheap or even free. Thus, the virtual wasteness of a used armchair can form consumer subjectivities (see also Hawkins 2013) in opposite ways.

Although purchasing used armchairs potentially requires special effort from consumers, recycling the armchair may still have a strong affective significance. This becomes apparent in, for example, online communities on Facebook and other online platforms that are organized for circulating used furniture. These kinds of communities may sometimes have clear and conscious goals to enable recycling and thus protect the environment, but there is often also more at play. For example, the idea of just throwing away the armchair of a passed relative may cause very strong feelings in some people, but the possibility of giving this item to someone who needs it can ease the pain. This idea often becomes apparent in such online communities—people who feel a connection to objects they wish to dispose of often want to know that the objects will have new ‘lives’. At the same

time, the person who receives the armchair may form an affective bond towards the object because they know its certain history and to whom it belonged. People may even be motivated to safeguard items that have once had personal significance to unknown others—as found in the case of vintage enthusiasts who perceive their role as part of a chain of owners in the object's long biography (Abdelrahman et al. 2020). In this sense, object biographies and collectively shared affective bonds to certain pieces of furniture clearly create new layers to the fold. Perhaps obviously, this makes the relationships with these objects more active and thicker than in situations where the armchair would just be dumped in a landfill. Through these kinds of shared cultural, historical, and emotional bonds, the relationships with used armchairs become collectively understood and shared. In this sense, the virtual wasteness of a used armchair may provoke collective action, which enables mutually shared processes of forming consumer subjectivity.

Compared to bananas and smartphones, the fold with a used armchair highlights the collectivity involved in the process of forming consumer subjectivity. The virtual wasteness of a used armchair seems to provoke certain collective processes, such as communities organizing around circulating the furniture and sharing understandings of certain object histories. Moreover, when acquiring a used armchair, one has to separate it from unwanted things, such as mould and pests. Here, the relationship with the object may become thicker through the active efforts that obtaining the object requires since one cannot just impulsively buy the object (or at least not without the potential for future problems). In this sense, the practice of circulating used armchairs illustrates how the fold entails multiple layers formed through connections with different human and more-than-human actors. Moreover, used armchairs often require repair and maintenance, and here the virtual wasteness of the object may constitute the subjectivity of consumers in completely different ways: the need to care for the armchair can enact an active relationship between the consumer and the object and thus form new layers to the fold and make the relationships thicker. At the same time, however, the efforts that the maintenance of the object require may prevent the relationship from forming at all. Furthermore, while consumers need to take care of both bananas and smartphones, what distinguishes the case of used armchairs is that the relationship with the armchair is much longer than that with a banana, and it will also very likely be longer than the relationship with a smartphone.

Discussion and Conclusion

This chapter set out to examine the constitution of consumer subjectivity by focusing on how the different wasteness of consumption objects shape our relationships with them. We utilized Deleuze's concepts of virtuality and fold to examine the ways in which the virtual wasteness of consumption objects shapes the folds, and how this results in thinner or thicker relationships with these objects. Previous literature on consumer–object relationships has tended to focus on concrete objects as they are acquired, appropriated, and appreciated by consumers. The dialectic relationship between consumer and object has most frequently been interpreted as the transmission of meaning, value, or affect (e.g., [Kuruoğlu and Ger 2014](#); [Gollnhofer et al. 2019](#); [Abdelrahman et al. 2020](#)). On the other hand, the literature on waste in consumer research has focused more on the consumer as an agentic manager of waste in everyday practices (e.g., [Brosius et al. 2013](#)). But, as [Hawkins \(2013\)](#) argues, waste is indeed capable of provoking action and shaping consumers' subjectivity.

Building on this notion, alongside the concepts of virtuality and fold, this chapter has illustrated that the virtual wasteness of different kinds of consumption objects plays out differently in everyday consumption practices, resulting in different consumer subjectivities. For easily perishable food items, the virtual wasteness is readily available and apparent, which affects the possibilities of forming attachments and subjectivity. Consumers are called in various ways to prevent food from becoming waste. However, the identified folds range from intimate care to boycotting the purchase of bananas altogether. Even though a banana does not have as rich a biography as a more durable consumer item, it may still result in a caring, active, and thick relationship with the consumer. This happens through multiple practices that aim to prevent the virtual wasteness of the banana from actualizing. However, at the same time, if we are not able to engage in practices of maintaining easily perishable bananas or end up 'forgetting' bananas we have purchased, the relationship becomes less active and thinner. In the case of smartphones, we find that the consumer–object relationship contains folds that result in an intimate relationship during the use phase, but also some that prevent the maintenance of a caring, thick relationship with one's smartphone. In this sense, the intimate relationship with the phone and inability to affect the process by which the virtual wasteness of the phone actualizes defines the possibilities of forming consumer subjectivity, making the relationship with

the phone thinner.² In turn, the example of used armchairs shows that consumer subjectivity can also be constituted through collective processes of folding. Multiple human and more-than-human actors affect the process of forming subjectivity in relation to used armchairs, and managing these relations as well as the repair and maintenance of objects adds new layers to the fold, making the relationship with the object thicker. Moreover, shared affective understandings related to the circulation of used armchairs illustrate how consumer subjectivity can be collectively constituted.

The folds can, however, also always change over time, sometimes rather dramatically. In this sense, the consumer–object fold is always in motion, folding and unfolding, over the lifespan of the object. For example, in the case of the banana, if the banana is eaten before it spoils, then the fold remains thick until the end of the relationship, but if the banana spoils or is ‘forgotten,’ the fold gets thinner and thinner until the wasteness of the banana actualizes. If we think about smartphones, then, when the consumer purchases the phone, there may be a great enthusiasm for the object in the beginning, and in the process of time, more and more of the person’s personal life gets folded with the device. Here, the relationship with the object grows thicker and thicker. However, at some point when the device stops functioning properly, the relationship with the phone starts to grow thinner again when the consumer starts to think about replacing the phone and starting a new relationship with another device. Finally, if we think about the example of the used armchair, the fold may become thicker over time through repair practices and new folds in the object biography. At the same time, however, time and wear of the object can make the relation thinner, as the maintenance of the object may start to require too much effort.

Altogether, our analysis brings value to understanding consumer–object relationships from the perspective of consumer subjectivity. We develop the notion of different virtual wastenesses of various consumer objects, folds, and resulting consumer subjectivity. The main contribution of this chapter to waste studies is a rich understanding on the virtual wasteness of consumption objects. We extend Hawkins’ (2013) notion that waste has performative capabilities to provoke subjectivity by highlighting that different kinds of virtual wastenesses provoke different kinds of subjectivities and that the virtual wasteness of objects shapes these subjectivities even before objects have turned into waste. We also bring a new perspective to a consumer’s role in relation to consumption objects. Rather than taking waste as merely

² However, resulting from certain policy actions, such as the ‘right to repair’ proposal in the EU (EU Commission 22 March 2023), the possibilities of repairing smartphones may be better in the future, and this may potentially change our relationships with our phones.

a sign that our relationships with consumer objects are thin and disposable, we illustrate that the virtual wasteness of consumption objects can also contribute to the creation of thick, caring relationships. This is meaningful from the perspective of sustainability, as societies are increasingly looking for solutions to excessive consumption and the careless use of natural resources.

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Waste as Posthuman Critique

Olli Pyyhtinen, Alma Onali, and Stylianos Zavos

Introduction

A truck moves in reverse gear in the waste reception hall, approaching skilfully yet routinely the threshold of a wide doorway of the vast concrete bunker and then dumps its cargo of trash down in the lair. A spider-shaped robot grabber navigates through the bunker, sifting through the heaps of remnants of once-desired things. Subsequently, this trash is transferred to a fiery pit to be subjected to combustion and transformed into heat, gas, and ash. Certain items nevertheless survive the annihilation process. Our tour guides showcased a designed cast iron pot that resisted obliteration and is now displayed in the guest hall of the incineration plant as a testament to matter's resistance and ability to persist. The minerals extracted from the bottom slag may still be repurposed, for example, in construction work, but the hazardous fly ash is transported in lorries to a landfill located 40 km away. On a subsequent visit to the landfill, we learn that the ash is mixed with water and cement to create a toxic batter, which is then poured into a huge rectangular concrete container. As the pool is about to be full, another one is already undergoing construction. Interestingly, the landfill workers refer to the pool as a 'mausoleum' that becomes the ultimate resting site for the remnants. One of our guides at the incineration plant referred to the ash storage as a 'big cake'. Currently, no one wants to have a slice of it, as there is no way to use it.

Current discourses and techniques of waste management frame waste as a passive and inert entity to be handled and fundamentally separate from allegedly active and autonomous human subjects. The cycle of waste incineration, which comprises the predominant manner of managing mixed

municipal waste in Finland, exemplifies such separation. As we suggest in the above vignette composed out of our fieldnotes concerning two separate visits to the field (from 16 January and May 30 2023), besides transforming waste into heat and electricity, combustion serves as an act of effacement; as a radical mode of waste elimination by burning it to ashes. As traces of a nonmemory or, alternatively, a memory of the fire, the resulting ash and the slag seem to bear a connection only to the burning fire and to the technical process of combustion rather than being associated with the consumer practices that produced the mounting masses of discarded objects. The efficiency of contemporary waste management infrastructures and technologies like incineration create an illusion of waste ceasing to exist once it leaves the confines of the home. Simultaneously, with our increased economic dependence on waste through the recycling, reuse, and recovery of waste as a resource, the circular economy takes a step forward to execute an even more far-reaching effacement of waste by aiming at the ultimate elimination of its very category.

In this chapter, we present a critique of the ‘ontological hygiene’ (see [Graham 2002](#)) inscribed in the idea of the fundamental separation of humans and waste by delving into dynamic ecologies of dis/entanglements that human beings forge with waste. In the case of waste incineration, the ash and the slag are remnants of material that once existed, which renders it a process wherein the incinerated waste undergoes both elimination and preservation. The ash and the slag amount to excess we are stuck with and thus need to live with.

This nuanced perspective of human–waste dis/entanglements explicitly aligns with posthumanist thinking. The onto-epistemological tenets of posthumanist perspectives decentre the human and challenge human exceptionalism by emphasizing the intricate entanglement of humans and non-humans (see e.g., [Barad 2007](#); [Hird 2012](#); [Braidotti 2013](#); 2019; [Kirby 2017](#); [Herbrechter et al. 2022](#); [Shildrick 2022](#)). By ‘posthuman’ we do not imply an emblem or defining trait of the present historical era (cf. [Braidotti 2019](#)). For us, the notion also stands distinct from the evolutionary scheme and techno-enchantment inscribed in transhumanism and certain forms of posthumanism (e.g., [Hayles 1999](#); [Fukuyama 2000](#)). In our usage, the term indicates a theoretical figure or notion, a sensibility towards the constitution of human subjects in their entanglements with nonhuman entities ([Pyyhtinen and Tamminen 2011](#)). Our perspective is grounded upon Karen Barad’s notion of ‘entanglement’, according to which ‘to be entangled is not simply to be intertwined with another, as in the joining of separate entities, but to lack an independent, self-contained existence’ ([Barad 2007](#), ix). In a nutshell,

waste serves as an invitation to critically question what it is to be human and acknowledge the interweaving of humans with the broader, more-than-human world. Unlike conventional approaches that perceive things through human use and linguistic constructions, this chapter examines the intricacies between humans and waste from a unique viewpoint, that of waste, thus making us refer to our empirical fieldwork as *garbography*.

Today, there is a pressing need for this kind of critical perspective, which emphasizes our entanglement with the broader more-than-human (Pyyhti-nen 2015) world, largely because of the socio-ecological crisis confronted by humankind. We have transitioned from the deceptive comforts of the Holocene to the Age of Man, the Anthropocene. Human activities affect planetary systems at an unprecedented pace and scale, having far-reaching repercussions for both humans and nonhumans. This transformative shift is also evident through the generation of waste. The diversity and volume of waste produced by humanity, from durable plastics to billions of animal bones, aluminium, and nuclear waste, has surpassed previous records.¹ The recycling paradox lies in the fact that the annual waste generation continues to grow despite our increased recycling and meticulous sorting efforts. A World Bank report published in September 2018 estimated that annual municipal waste will increase to 3.4 billion tonnes by the year 2050, up from around 2 billion tonnes in 2016, amounting to a roughly 70 per cent rise (Kaza, Yao, Bhada-Tata and Van Woerden 2018). The rejectamenta become embedded in the geological strata, shaping life on Earth. Attempts to address the aforementioned crisis sufficiently by resorting to ‘our species’ supremacy and the violent rule of sovereign Anthropos’ (see Braidotti 2019, 10, 122) remain inadequate and thus call for novel ways of thinking. In medical terminology, the term *critical* signifies a situation where the existence of an organism is in jeopardy (for example, due to a virus infection, a stroke, a heart attack, or severe bleeding), prompting the organism to reinvent its organization to survive (Serres 2014, xi–xii). Our understanding of critical thinking is derived from this etymological descendance. For us, posthuman critique revolves around developing new ways of thinking regarding the place of humans in the world amidst nonhumans, possibly renewing our practices.

Fundamentally, this chapter serves as an exercise in empirical philosophy (cf. Latour 1999; Mol 2002). While engaging with waste scholarship, STS, and posthumanist feminist literature, we also employ excerpts from our ongoing

¹ By referring to ‘humanity’ as a whole, we do not imply that all humans would be exposed to waste to an equal extent and in the same way. There are significant differences, for example, between countries of the Global North and Global South in how the risk–profit balance is distributed in relation to waste, and waste relations overall entail divergent subject positions.

empirical work in Finland. Our empirical materials encompass field notes from fieldwork on various sites, including households, incineration plants, and landfills (along with additional fieldwork conducted by our colleagues in other sites), in addition to interviews and media materials. We refrain from providing any systematic analysis of these admittedly heterogeneous materials, but we share selective small extracts to illustrate our theoretical claims.

The chapter unfurls in a structured format as follows. Initially, we will lay out the main target of our critique, the ontological hygiene underlying waste management, which characterizes waste as a distinct ‘other’, separate from human beings. Navigating through ambiguous and troublesome relations, which we underpin with the notion of *dis/entanglement*, the next section presents a critique of such ontological hygiene by proposing that human beings and waste are inextricably interwoven. In the penultimate section, we explain the consequences of such dis/entanglements, which call for an ethics of posthuman care that entails a relationship of mutuality. In the conclusion, we sum up our argument and touch on the implications of considering our relations with waste in terms of troublesome difference instead of othering.

Logic of Othering

The predominant rationalities and techniques of waste management treat waste as a passive and inert object to be reduced, reused, recycled, or recovered as a (potentially) valuable resource by humans. The recognition of waste as an object to be managed by humans is reflected in EU legislation. Article 3 of the EU’s Waste Framework Directive defines waste as ‘any substance or object which the holder discards or intends or is required to discard’ (European Union 2008/98/EC). This directive implies the control of humans over waste, as the destiny of substances and objects categorized as waste is dependent on human actions, intentions, rules, and regulations.

For us, the perspective of waste management embedded in the EU’s Directive, primarily in terms of *discarding*, reflects a broader cultural tendency in terms of how waste is conceived. The interlinkage between Western societies and waste since the rise of capitalist production and mass consumption has been typically marked by a *logic of othering*: disposal, separation, and exclusion (see also e.g., Corvellec 2016, 113–14). Waste has become a generic term for any substance that has lost its value and is therefore (destined to be) abandoned, rejected, or discarded. Situated at the lowest ranks of our hierarchies, waste has been interpreted as the result of a separation of the valuable from

the worthless, the desirable from the unwanted, the clean from the dirty, and the ordered from the disorderly. To some extent, it is indeed the very act of separation or exclusion that categorizes something as waste (Douglas 2001; Scanlan 2005).

The act of exclusion also draws a boundary between subject and object or self and other. Waste is often perceived and treated as an unloved and disturbing ‘other’; people usually do not seek to get in touch with it or pursue intimate relations with it but distance themselves from it. In this context, the concept of ontological hygiene manifests in the immunitary effort to prevent the human body from being contaminated. Waste expulsion is a means to establish the independent and autonomous, pure self (Hawkins 2001, 8). It is precisely the alienation of the other from the self which enables the self to constitute itself (Scanlan 2005, 15).

Characterized as ‘unruly’ (Reno 2015; Doeland 2019; Lehtokunnas and Pyyhtinen 2023), ‘fluid’ (Lehtokunnas and Pyyhtinen 2023), or ‘vagabond’ (Deleuze and Guattari 1987) matter with a proclivity to leak, overflow and expand, waste threatens to violate the boundary between the self and what we prefer to keep apart from it, necessitating it to be kept at a distance. To eliminate the risk of symbolic and material contamination caused by coming into contact with this abhorrent matter, humans try to tame its unruliness and ominousness through containment technologies (Pyyhtinen and Zavos 2024). Many normatively assigned containers such as bin bags, bins, furnaces, landfills, and repositories are designated for keeping waste in order. During a household visit, Kaisa, one of our informants, demonstrated to the garbographer all the containers used by her family to store waste at home. Along the tour, we first saw a sleek ash-grey touch bin under the kitchen window, which opened smoothly to reveal three buckets to collect the family’s mixed waste, biowaste, and plastic waste. Next, Kaisa pointed at a small dark box on the draining board containing wet coffee grounds. Afterwards, the garbographer witnessed the spot where the householders keep their paper waste, following which Kaisa showed the cupboards where they store empty bottles, metal, glass, and larger plastic bags, each in their designated place. In addition, she demonstrated the method of conserving cardboard waste by compressing it between the refrigerator and the living room wall. Finally, she suddenly recollected about the additional bin kept in their bathroom for disposing of their son’s diapers. Overall, after this brief exploration of trash management in the household, the garbographer and Kaisa determined that there were a total of 11 garbage receptacles located throughout the apartment. The containers prevented the uncontrollable spilling and expansion of waste materials in the space of the family’s home.

The logic of othering, however, is not limited to individuals trying to manage waste to get rid of it in their daily lives but also extends to public waste management infrastructures. Three technologies of waste disposal have been developed throughout human history: dumping, burning, and transforming waste into something else (Rathje and Murphy 2001, 33). Dumping is the oldest method and the most common form of waste disposal globally. Archaeologists have discovered the most primitive landfill in 3000 BCE in the city of Knossos in Crete, where people dumped their discards, such as ceramic wine cups, into large pits and covered them with soil. The modern-day landfill model was created in the late 1930s, and it took another couple of decades for it to proliferate (up until 1945, open-burning dumps and backyard waste burning, for example, were not yet prohibited in the United States). The modern landfill, characterized by systematic practices and closely managed burial of waste, marked the shift from the past midden. Placing waste in a designated place and burying it out of sight, away from residential quarters, a landfill was perceived as a safer, more hygienic waste disposal technology.

In Finland, landfilling was the primary method of waste disposal from the 1950s up until the 2010s. The ban on landfilling of organic waste in 2016, coupled with the rapid increase in the number of biogas plants and waste incineration plants, drastically reduced household waste landfilling to the current level of less than one per cent. Presently, incineration is the predominant method of mixed municipal waste disposal in the country. While the initial years of the new millennium witnessed only one incinerator in the entire country, currently, nine large incineration plants are operating, complemented by 24 smaller facilities which use waste materials as fuel along with other sources. Together, these facilities can burn 1.8 million tonnes of waste annually, with 98.6% of the mixed municipal waste produced subjected to incineration, in contrast to only 100,000 tonnes incinerated in 2006.

As a technology, there is hardly anything new in burning waste, even if we take into account only incineration plants and exclude unregulated practices such as open-burning dumps and backyard waste burning. The shift that has occurred is that the explicit goal of present waste incineration is no longer solely to eliminate waste through a process of irreversible consumption (tellingly, the first waste incinerator, which started operating in 1874 in Nottingham, UK, was named ‘destructor’), but to transform waste into heat and energy in accordance with the circular economy ethos. The transformation of the *modus operandi* of contemporary plants is reflected in a most discernible way in the change of vocabulary: on their web pages and in their brochures and reports, the facilities we have visited in our project insist on

being identified as ‘waste-to-energy plants’ rather than incineration plants, and the same term was adopted by the staff members.

While the circular economy boosts our economic reliance on waste via reappropriation, recycling and reuse (we use waste to heat our homes and buildings, fuel vehicles, and generate electricity), it still upholds and enforces a rigid separation between waste and humans. It disregards the inextricable interconnectedness of humans and waste by attempting to eliminate the very notion of waste: ‘everything previously considered waste is revived for other uses, effectively eliminating not only waste but the concept of waste altogether’ (Lacy and Rutqvist 2015, 52). Waste is, as it were, ‘designed out’ and expected to ‘unbecome’ by design (Gregson and Crang, 2010; Crocker, 2018). The circular economy’s techno-utopian visions of a zero-waste future are fuelled by the fantasy of a ‘self-enclosed circle in which all waste, all useless remainder, is sublated’ so that ‘nothing gets lost’ and ‘all trash is reused’ (Žižek 2010, 35). Those visions are in a continuum with modernization and progress stories, which, in their forward momentum, hardly leave any room for useless waste, remnants and surplus (Tsing 2015).

Whether through dumping, burning, or repurposing, waste is sought to be kept apart from active and autonomous human subjects who are assumably in control of things. Yet, despite the strenuous efforts, humans fail to separate themselves from waste or eliminate it. Contrary to the prevailing concept of othering and the utopian visions of a circular economy, as we contend in the subsequent sections of the chapter, humans are entangled with waste in a much more intimate and complex manner.

Intimate Dis/entanglements: There Is No ‘Human’ without Waste

Instead of adhering to the concept of ontological hygiene, which assumes an outright separation of humans and waste, we commence from their inextricable connectedness. Recent posthumanist perspectives have contested the human/nonhuman and nature/culture binaries (Braidotti 2022) and emphasized the entanglement of humans with various entities like bacteria and viruses (Paxson and Helmreich 2014; Brives, Rest, and Sariola 2021), soil (Haraway 2016; Puig de la Bellacasa 2017; Krzywoszynska 2019), technology (Haraway 1991; Hayles 1999; Braidotti 2013), and nonhuman animals (Haraway 2004; Wolfe 2009; DeMello 2012). Despite endeavours to free themselves from waste through the above-discussed technologies of othering, human beings remain intimately connected with waste materials.

Simultaneously, the human–waste entanglement is quite different from the way viruses are an integral part of human DNA or how the soil is crucial for the subsistence and maintenance of human life and its environments. Waste does not constitute a part of our being in the same way as our ‘gut buddies’ (Lorimer 2017). We do not depend on waste for our survival. Contrary to being essential in shaping human beings, garbage is undesirable to live with and is therefore expulsed, discarded, and abandoned to avoid contamination. Nonetheless, humans are never entirely free and separate from waste. To acknowledge this conflicted duality of detachment and attachment, dissociation and association, we propose the anti-dualist notion of *dis/entanglement*. It is an attempt to embrace and integrate the double nature of waste, recognizing it *both* as a product of an act of separation (to some extent it indeed needs to be kept at a safe distance from human bodies) *and* an integral part of ourselves. Waste simultaneously stands as a mark of the boundaries between humans and nonhumans and attests to their fragility, blurriness, and permeability.

This is a way of saying that our lives are closely interwoven with waste. ‘Waste is an inseparable part of life,’ Kaisa replied during the aforementioned guided ‘waste tour’ around the family’s home when the garbographer asked her about how waste manifests in their household. While the waste materials stored by Kaisa’s family in the numerous containers are somewhat kept out of sight, they are integral to everyday life and mundane practices that include emptying the containers at regular intervals, cleaning the bins, washing tin cans and glass jars, piling up recyclable paper, and so on. Moreover, people do not merely encounter and need to handle existing waste, but they also constantly generate waste. One could even argue that waste is an inevitable side-product of human activities, thus imparting a waste aspect to all human activities.

Gay Hawkins (2006) has emphasized the materiality of waste in her prominent work on the ethics of waste. As she expresses it, ‘to reduce waste to an effect of human action and classification is to ignore the materiality of waste, its role in making us act; the ways in which waste is both a provocation to action and itself a result of that action’ (Hawkins 2006, 4, 5). This perspective diverges from the traditional approach of waste management to waste as an object that surrenders to human manipulation. However, the aforementioned containment efforts prove that waste is dynamic and can never be in perfect order. Having ‘thing-power’ (Bennett 2004, 2010), waste resists human efforts and disturbs the smooth functioning of things. To attend to the materiality of waste, the assumedly autonomous human subject cannot occupy the centre of analysis. This line of thinking, rather, calls for a shift

of emphasis from the human agent who classifies, generates, organizes, and manages waste to what waste *does* and how humans become entangled with it. Waste initiates actions and requires attention, not only from individuals and households but also from large institutional infrastructures established to manage it.

How does waste make us act, then? It may call for our attention, it may leak, and it may make its presence felt through accumulation, leaving marks and odours, and provoking visceral reactions such as repulsion, disgust, or even physical discomfort. To exemplify, Kaisa mentioned that despite being very handy and chic, her family's touch bin, where they keep their mixed waste, biowaste, and plastic waste, is prone to diffuse an unpleasant scent of boiled or fried biowaste in their home, especially during the winter, when the radiator next to the bin is hot.

Engaging with waste prompted strong visceral reactions also in those members of our research group who contributed to a waste composition analysis conducted by a municipal waste management company. For several days, the team shovelled samples of mixed household waste collected randomly from different residential areas within the municipality. A hundred kilos of mixed waste amounts to a heaped 660-litre waste container. In this process, they would unpack the heap, bag by bag, sorting everything into approximately 35 different categories. In her field notes, the second author of this chapter describes her visceral encounter with waste as follows:

The sweltering heat of a late summer storm intensifies all the odours that emanate from the bags that have been sweating and tightly packed together for a significant portion of the day. With a sheath knife in hand, I forcefully tear apart many bags, one after another, on a table that is covered with a sieve. Most of the contents are somewhat predictable: smushy paper towels, stale bread, empty toothpaste tubes and food packages. Due to our location in Finland, everything is often covered in dark brown coffee grounds. Every bag is preluded by a tiny moment of hesitation. What if this is the wrong bag to pick? What if this one is filled with cat poo or rotten diapers? Cowardly, I tend to pick lightweight bags. The heavy-looking ones are usually the worst, both in terms of smell and appearance. Despite my body's natural inclination to avoid the chore, I override my visceral urges with a determined work ethic, driven by the mission to establish order in this mess by way of sorting. Soft and damp textures are the hardest to handle. The squishy denseness of never-eaten boiled potatoes or the slimy remnants of a dinner conquered by very potent mould triggers a repulsion that I feel constantly creeping at the back of my throat. My colleagues bravely stick their fingers in the mess while I use tongs and small spades to keep a safe distance from the all-too-intimate remnants. Plastic packages, which normally haunt us and take up space in our tiny homes, are almost

benign compared to the more sense-challenging stuff. The packages are light and often odourless and dry, easy to pick apart from the rest of the smudge. Likewise, I find glass and metal items easier to deal with. What is it about the organic that makes me so disgusted? However, the most obvious sources of disgust do not shake me: occasional maggots present a macabre surprise, almost a delightful sign of life amidst this environment of decay and death. I lift them closer to my sweaty protective glasses to marvel at their smooth, curly movements. (Field notes 9 August 2023)

For a researcher, the process of physically seeing and sorting these familiar but somewhat unfamiliar remnants enacted a shift in subjectivity; it was far more difficult to assume the mindset of a carefree consumer. Tampering with and rummaging through this stuff evoked a sensation akin to a secretly performed autopsy on people's wastes or bringing something lifeless back to life, as if commodity zombies. There was also a disconcerting sense of crossing a boundary to the exercise, as there is something intimate to one's wastes, and most likely, none of the people who had discarded the remnants of their everyday existence ever imagined the possibility of someone scrutinizing their trash after disposal. The act of opening the bin bags and going through the contents thereby also unveiled the spectral quality of waste (Doeland 2020; cf. Derrida 2006). Waste does not disappear but remains in an uncanny absence–presence even after the act of disposal, as a trace or ghost of the things that once existed. While being something left behind that should, therefore, belong to the past, waste haunts us, affecting and disturbing our existence in the present (Pyyhtinen et al. 2023). Even after leaving the research site, the scent of waste followed the researcher home, lingering in her nostrils and turning the dinner she was planning to eat into an echo of its inevitable future: in an umami sauce and a sweet apple, the aroma of decay could be felt as an uncanny undercurrent.

In the waste sorting exercise organized by the waste management company, the intimacy of waste combined with its mundaneness resulted in a somewhat dampened mood quite different from the excitement of treasure hunting present in voluntary dumpster diving (cf. Lehtonen and Pyyhtinen 2020). There were not many surprises, just inescapable decay and traces of mundane routine tasks performed amidst a busy life by the previous item holders. Hence, passing moral judgements on the bags felt futile. Rather, a sense of shared responsibility and guilt was provoked: we all live like this. The awareness that 'anything and everything can become waste' (Kennedy 2007, 1) crept in, highlighting the fact that we, as humans, bear responsibility for the things that we make and that make us. This underscores the interdependence of humans and waste and the troublesome nature of

the dis/entanglement in which they are bound together. Due to the otherness that it embodies, waste appears as something alien and repugnant to us, yet it is inextricably ‘ours,’ both as our creation and as a challenge that falls under our purview. Through its presence, waste prevents us from detaching ourselves from otherness (Pyhytinen et al. 2023). On the contrary, waste binds humans, nonhumans, and the Earth in vulnerable togetherness.

After examining how waste is an integral part of human beings, the subsequent section involves contemplating the repercussions of such entanglement. It goes beyond determining that humans are dis/entangled with waste, insisting on the need to explore the ethico-political implications of those dis/entanglements. To accomplish this, our focus shifts to an ethical relationship with waste, in connection with the question of posthuman care.

Towards Posthuman Ethics of Waste-Care

While gaining a crucial affirmation of the interconnectedness of humans and waste and the convergence between entanglement and posthuman epistemologies, the question that pressingly haunts the analysis is both simple and complex: so what? What impact does it have on our actions to acknowledge that humans are entangled with a diverse array of waste materials spanning from the microscopical to the planetary scale? To what extent could the admission of dis/entanglement foster alternative modes of thinking and acting?

The inability to eliminate or transform waste materials into something else without meticulous efforts calls for ethico-political commitments to waste and to a sustainable world. There is a dire need to find ways to live well with waste, ‘understanding the responsibilities embedded in our actions and our relations with humans and nonhuman things’ (Hawkins 2017, 16). This ethical requirement highlights the analytical lens of *care* (e.g., Hawkins 2006; Lau 2022), articulated by Joan Tronto and Berenice Fisher in their much-cited definition as ‘everything that we do to maintain, continue and repair “our world” so that we can live in it as well as possible. That world includes our bodies, ourselves, and our environment, all of which we seek to interweave in a complex, life-sustaining web’ (Fisher and Tronto 1990, 103). Echoing Justin Chun-Him Lau (2022), we propose that care affords and entails a distinctive way of engaging with waste. It is different from the politics of exploitation and resource mobilization inscribed in the conception of waste as a resource

and property just as much as from the politics of exclusion and subjugation implied in the conception of waste as a risk. Both these notions characterize predominant modes and rationalities of waste management, as we have argued above.² However, building on the deliberately self-contradictory notion of dis/entanglement, the ethics of care (see [Puig de la Bellacasa 2017](#)) that we propose here, extending beyond the anthropocentric concept of care, allows the more-than-human to actively participate in and influence ethical constellations.

Posthuman ethics expand the field of ethical actions and engagement by involving humans and non/other/more-than-humans within it and approaching them all with the same aim of empowerment ([Braidotti 2019](#)). ‘Empowerment’, or *potentia*, refers to the affective capacity to pursue a multiplicity of meaningful and intimate associations with the world and should not be conflated with the notion of ‘power’, which refers to the sense of exercising power over something, validated in the context of waste management by the politics of exploitation and resource mobilization and the politics of exclusion and subjugation. Next, we delve into the ways in which empowerment might resonate with *care-ful* human–waste dis/entanglements with the help of two illustrative examples: landfill remediation through metal phytoextraction and emergent affective relationships with household waste.

Our first instance of care-ful human–waste relations takes us back in time for decades to an industrial landfill site, Pig’s Eye Landfill, in St Paul, Minnesota. The landfill was heavily contaminated by metals. Artist Mel Chin and agronomist Rufus Chaney successfully collaborated in an experimental project called ‘Revival Field’ (1991–ongoing). On the one hand, the species of plants capable of cleaning up the contaminated soil through phytoremediation in the landfill were identified, while on the other hand an ecology with invisible aesthetic outcomes was sculpted ([Pawlowska et al. 2000](#); [Miller 2016](#)). The artist’s website quotes:

Conceptually, this work is envisioned as a sculpture involving the reduction process, a traditional method when carving wood or stone. Here, the material being approached is unseen, and the tools will be biochemistry and agriculture. The work, in its most complete incarnation (after the fences are removed and the toxic-laden weeds harvested), will offer minimal visual and formal effects. For a time,

² Besides the theoretical framings of waste as a resource and property and waste as a risk, [Lau \(2022\)](#) also identifies the notion of waste as prosperity as a major stream of research in discard studies. It is connected with the politics of the everyday lives of informal waste workers (see e.g., [Morais et al. 2022](#); [Millar 2018](#)), and thereby, it falls outside our focus, as we are interested in this chapter primarily in the ontology of hygiene assumed by current modes of waste management and how to critically contest it.

an intended invisible aesthetic will exist that can be measured scientifically by the quality of a revitalized earth. Eventually, that aesthetic will be revealed in the return of growth to the soil. (Chin 1990)

For us, the project Revival Field corresponds to a fascinating example of posthuman ethics of waste care by transcending traditional human-centred boundaries in artistic, scientific, and aesthetic fields. It embodies the formation of affective and productive care-ful relations which proliferate autonomously without further human intervention. Those relations entail both flourishing and decay, causing the emergence of an ecology through collaborative survival (see Tsing 2015). Most notably, a more-than-human confederation like this brings together an amalgam of potentials: Chin has stated that the Revival Field springs from ‘a catalytic concept that allows for something to form after you’re no longer there. It becomes an essential part of creating a platform for languages that don’t even exist yet’ (Miller 2016, 216). The project Revival Field thereby entailed a temporal scale stretching beyond the lives of human subjects and a politics of inclusion, expressing appreciation of, attentiveness to, and responsibility for the waste work carried out by other forms of life (Lau 2022, 12).

The second instance requires both a jump to the present—marked by the decline of landfills in Finland and the rise of waste incineration—and a revisit to the waste sorting exercise mentioned in the previous section. The waste management company organizing the study aimed to seek insights into the composition of waste produced by households and the amounts of recyclable and organic waste that end up being incinerated amidst municipal solid waste. For researchers interested in dis/entanglements, the process provided a viscerally rich experiential and experimental milieu. Sorting the waste materials produced affective, intimate, and troublesome engagements, where knowing and thinking—learning more about and with the waste materials—required not only care (Puig de la Bellacasa 2012) but also overcoming the disgust and occasional dread that were effectively and disturbingly present (Lehtokunnas et al. forthcoming). The care was a matter of dis/entanglement rather than warmth and affection, necessitating the use of layers of protective equipment to counter the potential hazards of waste materials. Despite the precautionary measures, the nature of the work compelled careful and thoughtful interaction with waste, thinking and wondering about the waste materials. As the participants noticed during their hands-on work, entanglement happened when human and other ‘bodies’ (e.g., larvae, mould, and decomposition, plastic and carton) would meet, shifting othering into familiarization. After initial confusion and hesitation, waste gradually started to make itself known.

Sorting out household waste is a small yet meaningful step towards cultivating an affective ethics of care towards the materials that we discard in our everyday lives. Instead of mindlessly throwing everything in one bin, people have been slowly learning to spare time and space for waste, to care in tactile and practical terms for the impacts their discards will forge after collection. However, not all waste materials turn equally into lively collaborators in more-than-human care relations, as demonstrated by [Kinnunen and Duque \(2022\)](#) with their ethnographic examples of robot vacuum cleaners and bokashi practitioners. Biowaste, for instance, tends to receive greater enthusiasm, warmth, and affection compared to dust or plastics.

The variation between the practice of sorting out household waste and the act of metal phytoextraction lies in the explicit association of the former with human subjectivity that further undergoes capturing and controlling through exclusionary and exploitative management procedures. This is, perhaps, where Hawkins' (2006) ethics of waste, too, encounters its limits since the notion of ethics employed by her is explicitly human-centric. Contrastingly, in posthuman care, ethics acquires an expanded, encompassing, and non-anthropocentric meaning embedded in what [Braidotti \(2019\)](#) refers to as *zoe/geo/techno assemblages*: consortiums where living and non-living entities interact in ways that cannot be predefined. Expanding the field of ethics beyond the human, the posthuman notion of care is guided by the desire to 'multiply worlds and celebrate the emergence of an infinite number of modes of existence' ([Despret 2021](#), 6). The quest towards an infinity of modes of existence, of multiple worlds, necessitates learning how to live together and how to coexist through relating. A field is thus outlined, waiting to be explored and mapped, whereby modes of relating through empowerment emerge through active, creative, and experimental pursuits. This precisely forms the precondition for posthuman ethics of care concerning waste: working through alliances of difference instead of logic of othering while tracing and prioritizing the dis/entanglements that facilitate collaborative survival.

We must reiterate the fact that waste is a troublesome companion. Continuing to acknowledge its problematic nature, however, exposes dispossession, waste-producing practices occurring in proximity and eventually sparks questions about the processes taking place before and after the transformation of something into waste. Placing waste at the centre of an ethics of care through posthuman thinking sheds light on minoritarian ([Deleuze and Guattari 1987](#)) tactics that contest and diverge from the functional mechanism of the consumer-capitalist system geared to produce waste (as a marginalized by-product to be eliminated or transformed into something else). Posthuman ethics of waste care thus entails abstaining from

harmful exclusion and exploitation-based relations and instead involves engaging in practices and relations that facilitate a range of multispecies creatures to live well among each other.

Concluding Remarks

In this chapter, we have adopted a critical stance regarding the modes and rationalities of contemporary waste management practices by examining their underlying idea of ontological hygiene, which assumes a principal separation of humans and their waste. With the notion of dis/entanglement, our objective was to bring waste deemed as the excluded ‘other’ belonging to the ‘outside’ back in, to be recognized as part of humanity. This is not to deny the constitutive act of separation and boundary-making in defining waste and our entanglement with it. On the one hand, waste is admittedly a result of an ‘othering’, marking a separation of the valuable from the worthless and the desirable from the undesirable, as well as the self from the other, from what we do not want to be part of the self. Yet, on the other hand, humans are never entirely separate from the ‘other’ presented by waste but are inextricably entangled with it ecologically, politically, and physiologically; the separation is far from absolute. Regardless of all the efforts to obliterate waste through underground burial or incineration, it does not disappear but rather flows elsewhere and only changes form. Ultimately, whenever humans are with each other, they are also with waste—human togetherness always implies the haunting presence of waste—and there is no ‘human’ without waste, but the two coexist; the appearance of the human marks the appearance of waste, and waste enables particular sorts of humans to emerge. Even the circular economy, while presenting an alternative to a wasteful linear economy, fails to relieve us from waste. Therefore, our most intimate waste relations, beyond industrial-level reorganization, require critical rethinking. The concept of dis/entanglement accomplishes this by emphasizing our complicated and troublesome relations with waste.

For us, engaging with waste also contributes to the posthumanist literature on entanglements. While recent posthumanist perspectives have predominantly focused on the vital entanglements that mould humans into what they are or set the preconditions of our collective survival in the Anthropocene, an analysis of waste provides a supplement to those approaches. Waste is hardly indispensable for the sustenance and well-being of humans; we would be better off without it, prompting reconsideration of our current unsustainable

production and consumption practices. It corresponds to potentially dangerous, contaminating, and ‘bad’ matter, which is not good to live with. To a certain extent, it becomes imperative to keep waste at bay. Yet, the relational, anti-dualist emphasis of the notion of dis/entanglement implies that danger and harmfulness need to be understood not as fixed characteristics of some entities and materials but as practical outcomes and emergent features of relations. Waste can be both beneficial and hazardous, productive and disruptive, manageable and unruly.

Ultimately, the dis/entanglement constitutive of the relationship between humans and waste prompted us to contemplate on an ethics of waste care, in contrast to current efforts of waste control, waste reclamation, and eventual elimination. This attempt also served as an account responsive to the pressing issue of ‘so what.’ Through the illustrative examples of landfill soil remediation and sorting out of domestic waste, we aspired to demonstrate how these instances of care-ful human-waste dis/entanglement challenge the anthropocentric notion of care in their own unique ways. The ethics of waste care cannot be confined to practices driven by human affects and subjectivities. The ethics of waste care that we explicated advocates for an expanded perspective that, instead of impoverishing and constraining our relationships to the sphere of human actions and meanings, fosters modes of more-than-human co-existence. Our comprehension of critique along Foucauldian lines in the chapter resonates with this. We did not intend to present the two illustrative instances as generalizable models of how people should act. Rather, in their minoritarian nature, they pointed towards the possibility of different kinds of practices, of things being otherwise. Instead of prescribing ‘what needs to be done,’ we portrayed them as a ‘challenge directed to what exists’ (Foucault 1994: 236), multiplying sings of life, not judgments (Foucault 1997, 323). Ultimately, empowerment as the proposed foundation of posthuman ethics of waste care entails navigating through troublesome *differences* rather than otherness. Thinking waste in terms of dis/entanglements thus disrupts traditional notions of identity, relationship, and kinship, urging us to make ‘oddkin’ (Haraway 2016) with the world.

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PART II

SOCIETY

Feeding the Critique of Standards with Waste

Exclusion and Reactions in Food Systems

Nadine Arnold

Introduction

Standards permeate society (Brunsson and Jacobsson 2000; Timmermans and Epstein 2010; Busch 2011). Practitioners and scholars in economics, business, and law emphasize the contribution of standards in enforcing quality and creating efficient, transnational coordination (e.g., Blind 2004; Yang 2023). In contrast, the sociology of standards has taken a critical stance on standards and standardization (Bowker and Star 1999; Busch 2011; Higgins and Lerner 2010; Lampland and Star 2009; Timmermans and Epstein 2010). The focus of criticism is on the mismatch between the global and abstract standards and the local realities that need to be made fit to the standards' formalized expectations. This mismatch creates and triggers inequalities and power imbalances among those who set, follow, and do not follow the standards (e.g., Star 1990; Bowker and Star 1999; Lampland and Star 2009; Higgins and Lerner 2010; Loconto and Arnold 2022). Undesirable consequences result from the fact that 'every standard necessarily elevates some values, things, or people at the expense of others, and this boundary-setting can be used as a weapon of exclusion' (Timmermans and Epstein 2010, 83).

This chapter illuminates and highlights this exclusionary function of standards by mobilizing the notion of waste, contributing to a critical analysis of how standards govern. Scholars from waste and discard studies have emphasized that waste is socially constructed and context dependent (Gille and Lepawsky 2021; Liboiron and Lepawsky 2022), being 'the by-product of a systematic ordering and classification of matter, in so far as ordering involves

rejecting inappropriate elements' (Douglas 1984, 36).¹ Thus, waste refers to what is excluded and disvalued. That is, waste is approached comprehensively, encompassing not only tangible, solid materials but also recognizing that humans, places, ideas, and knowledge are discarded (Liboiron and Lepawsky 2022). Such a comprehensive understanding of waste makes it an excellent entry point for investigating the exclusions brought about by standards and for advancing a critical perspective on standards.

By investigating how waste and standards intersect, this chapter aims to provide a better understanding of their interplay. Exploring the standards–waste nexus is pertinent for waste and discard scholars seeking to account for the hitherto under-examined and under-theorized role played by standards in the construction of waste. Additionally, linking the study of standards with waste provides the sociology of standards with an analytic focus that allows researchers to understand the valuelessness generated by standards, which has been scarcely studied due to a prioritization of the ways in which standards construct and enforce values (Loconto and Arnold 2022). Step by step, this chapter will trace the intricate and dynamic relationship between waste and standards, allowing us to understand that waste is a consequence of standards, but at the same time, waste also drives the setting of standards, thus further propelling their multiplication. This reflects the idea that standards are done in practice when applied in specific contexts (Higgins and Lerner 2010; Timmermans and Epstein 2010; Arnold and Loconto 2021).

To exercise and advance the critique of standards through the lens of waste, I will follow the suggestion put forth by sociologist Vobruba (2013), who advises conducting second-order observations. This approach entails refraining from asserting the author's own critical standpoint or prescribing their normative values, but rather observing how others (e.g., researchers, policymakers, practitioners, or activists) critically observe standards in relation to waste. To observe the critiques directed at standards, I draw on the empirical case of food systems and occasionally rely on my own previous empirical studies on food waste (Arnold 2021, 2022). Generally, food systems are inundated with standards that focus on processes and food properties that coordinate production, trade, and consumption (Henson and Reardon 2005; Busch 2011; Bain et al. 2013). While standards are relevant in other sectors (e.g., medicine, construction, education, sports) that would also offer a rich empirical setting for investigation, the focus on food will prove advantageous in illuminating the wasteful exclusions brought about by standards.

¹ For a critical discussion on the utilization of Mary Douglas's work for the conceptualization of waste, see Liboiron (2021).

Food standards, in particular, have been critiqued for the inequalities they engender, particularly their contribution to food waste and the exclusion and devaluation of marginalized small-scale producers.²

In the following section, I delve into the sociology of standards and follow Busch's (2011) typology of standards to detail how standards generate waste through hierarchization, filtering, and division. I illustrate that waste is an inherent component within standardization processes and observe the extent to which this exclusionary facet gives rise to a critical discourse centred around food standards. Interestingly, the discernible critique focuses in a constrained manner on non-human waste, and subsequent reactions are mainly directed towards tackling food waste. By shedding light on these reactions, Section Three of this chapter identifies two diametrically opposed responses to the waste-centred critique of standards: the introduction of additional standards and the bypassing of existing standards. I conclude by discussing these contrasting reactions and reflecting upon how and why waste could significantly propel the pertinent, yet little recognized, critique of standards in a meaningful direction. Specifically, the chapter refines the critique of the excluding nature of standards by demonstrating that standards exclude various things in different ways, but the mitigating reactions to these exclusions substantiate existing standards and drive their proliferation. Against this backdrop, an appeal is made for a more reflective approach to standards.

Standards Exclude and Generate Waste

Standards matter across diverse societal spheres, ranging from medicine to education and sports, and play a particularly vital role within markets and value chains. Standards contribute to determining the quality and values of exchanged goods in markets (Eymard-Duvernay 1989). Food markets and supply chains undergo significant influence from these standards, as standards are mobilized to define multiple values of food, such as safety, health, environmental protection, and animal welfare (Loconto and Arnold 2022). However, as per Gille's (2012) perspective, food markets and value chains are not solely infused with values; they are also imbued with waste.

This implies that within the food system, we are likely to encounter not only multiple standards and values but also waste generated by these

² Food waste is an ambiguous term, and numerous clarifications are suggested. In this chapter, I use the term broadly, so that it refers to any food that is discarded, even though it might still be edible.

standards. While standards are typically made explicit through their formal development and implementation, waste often tends to remain implicit. To systematically explore the interplay between standards and waste, I employ the typology proposed by [Busch \(2011\)](#) in the following subsections to explain how standards construct social realities. Busch distinguishes four types of standards: ranks, filters, divisions, and Olympics. However, I focus on the first three and omit the so-called Olympics. While Olympics in food systems do occur (e.g., best wine, best Swiss cheese), they are not examined because, unlike the three other standards, they play a limited role in creating order in food systems and have a lesser impact on waste, given their focus on selecting a singular winner. However, using this typology will prove beneficial in comprehending how standards establish order in various manners, subsequently influencing exclusion and waste creation in distinct ways. Furthermore, it offers the advantage of addressing both aesthetic product standards that measure quantifiable food attributes and the more recent process standards that regulate food production and trade ([Bain et al. 2013](#); [Arnold and Loconto 2021](#)). Both are pertinent for creating order within food systems and may evoke critique.

Before detailing how standards generate waste and how this becomes the subject of critique, it is important to note that the standard-setters do not actively want this waste to occur. That is, standard-setters focus on the intended, desired positive effects (ensuring qualities and values for the sake of coordination and compatibility) while passively and implicitly accepting that the use of standards will imply exclusion and waste generation. The underlying belief is that, with sufficient effort, followers can achieve the goals and expectations set by the standards. However, the Food and Agriculture Organization (FAO) suggests that a failure to meet standards can go unreported, which is why waste can be considered a sign that qualities and values are effectively being enforced by standards. The FAO writes:

The loss of food during processing is usually the result of human error, poor management or technical malfunctions that lead to a rejection of the final product due to non-compliance with standards imposed by buyers. However, low rejection rates are not necessarily an indication that defects are rare; on the contrary, low losses may reflect poor compliance with food safety and quality standards or enforcement thereof. (2019, 37)

However, as the subsequent subchapters show, the interaction between waste and standards is dynamic and intricate, and it confirms that there is usually

something or someone that does not conform to the standards (Star 1990). In other words, standards leak, leaving traces that do not meet the standards' expectations (Olofsson, 2025).

Standards Hierarchize

Busch (2011) refers to standards that establish a hierarchical order as ranks. In the case of food, ranking standards, which are often called grades, are omnipresent and have long been taken for granted. For instance, the Organization for Economic Co-operation and Development (OECD) has been developing ranking standards since 1962 to ensure the quality of fruits and vegetables and to facilitate a common interpretation on an international scale (OECD 2023). Quality, in this context, primarily pertains to the aesthetics of food produce, with meticulous criteria leading to the hierarchization of food into different classes. Let me illustrate this with a specific example. Taking a closer look at the OECD standard for avocados, we learn that avocados are ranked in three classes, extra, first-class, and second-class, for which sub-ranks are set about outer appearance, such as size, shape, or colour (OECD 2020).

Aesthetic, hierarchical standards are integrated into the food production process, including sowing, harvesting, and packaging, in such a way that visually perfect food is offered to consumers (Legun 2017; Arnold and Loconto 2021). However, realities in agricultural fields often involve unfavourable weather or diseases that create varied circumstances and not-so-perfect food. Returning to the example of avocados, this means that they become second-class avocados because they 'do not qualify for inclusion in the higher classes but satisfy the minimum requirements' (OECD 2020, 16) or they become completely excluded from the markets because they do not meet even the minimum standards for being graded as low-ranked. While these lowest-ranked avocados may not be traded, a Dutch organization specializing in processing sorted-out avocados into oil points out that in Europe, 20 per cent of imported avocados are not sent to supermarkets and retailers (one million avocados per day) because of their nonstandard outer appearance (Soilmates 2022). The small Dutch oil manufacturer saves about three million of these sorted-out avocados annually, but most of the 20 per cent are burnt as biofuel, with an estimated 1–2 per cent being converted into guacamole (Soilmates 2022).

The fact that ranking standards sort and exclude imperfect avocados from markets and value chains is illustrative of an overall trend in food systems:

A factor that contributes to food waste at retail level, especially in high-income countries, is the tendency to sell homogeneous and ‘perfect’ produce (in terms of colour, shape, size, etc.) Food that fails to meet these high standards is discarded. (FAO 2019, 37)

Waste thus contributes to maintaining the visual perfection of food. However, it is possible that nonstandard food will be used for purposes other than human consumption or that it will never even be harvested, as emphasized in an excerpt from another Food Waste report. The ranking in this report makes an interesting disvaluation of animals, the feed for which is considered less valuable than produce ranked for human consumption.

By specifying high standards in shape and appearance, especially for fruit and vegetables, produce out-graded from the market may command lower prices. Where prices do not cover harvesting and other farmer costs, produce may be left unharvested, culled during harvest or used in low-values, such as animal feed. (WWF-UK 2021, 18)

The FAO estimates that approximately one-third of all food produced for human consumption worldwide is wasted or lost. This amounts to approximately 1.3 billion metric tonnes of food annually, which, of course, are not solely discarded due to rankings standards, but they are indeed identified as contributing factors (FAO 2019; Johnson 2020; WWF-UK 2021). To give another empirical example, in Switzerland, approximately half of all cultivated potatoes are lost along the value chain, whereas half of the total potato losses are discarded because of missed aesthetic standards (Willersinn et al. 2015). While these findings lead the authors to conclude that ‘in medium- and high-income countries, quality standards are the main reason for food losses’ (Willersinn et al. 2015, 10), others critique that aesthetic standards are embedded into EU regulations and enforced by supermarkets, which often add supplementary standards (Porter et al. 2018).

While natural scientists who quantify food waste volumes provide significant empirical evidence that ranking standards engender food waste, a sociological perspective on these standards explains that waste can be expected due to the hierarchical nature established by any rank. The lower the food is in the hierarchy, the greater the risk that the food may find no other uses in other domains, such as feeding animals or biogas production. At the bottom of the hierarchy, food waste is deemed unworthy of further processing and is regarded as valueless. Importantly, one should note that all

this food waste contributes to maintaining and stabilizing the order-building role of existing standards.

Standards Filter

Standards function as filters when they sort in an either-or way, highlighting and demanding specific qualities (Busch 2011). A notable and familiar example is date labelling, which filters between food that is safe for consumption and food that poses risks. While food expiration has been a long-standing risk addressed by filters, newer risks pertain to pesticides and other chemicals (Buchler et al. 2010). Recently, multiple filters have been developed to mitigate these ecological risks and introduce new and societally desirable socio-ecological qualities into food systems (Henson and Reardon 2005; Bain et al. 2013). The most well-known examples are organic and fair-trade standards, but there are also filters that highlight other qualities, such as dolphin-friendly, halal, or GMO-free. All these process standards act as filters because they sort the valued produce (e.g., fairly traded chocolate, organically produced apples, dolphin-friendly tuna) from conventional food offerings. To observe how critique is directed towards these filters, I will proceed by addressing the safety-motivated filters (date labelling) and then moving on to the more recent socio-ecologically motivated filters (e.g., fairtrade, organic).

Date labelling, which filters between safe and non-safe food, is criticized in a similar manner to ranks, as date labels have been identified as a significant cause of food waste. Specifically, the European Union (EU) highlights that ‘up to 10% of food waste generated annually in the EU is linked to date marking’ (European Commission 2023) and demands information campaigns about how to correctly interpret the various date labels. This is because numerous studies have demonstrated that consumers waste edible food due to confusion caused by date labelling (cf. Wilson et al. 2017). Typically, consumers confuse the date that filters safety (‘use-by’) with the date that filters quality (‘best before’), and then they discard edible food that is probably not at its best but is still edible. The underlying main issue is that individual consumers are faced with the conflict of prioritizing safety or ecology and may waste perfectly edible food just to be safe (Milne 2012).

While it is relatively easy to identify how and why safety filters generate waste, it is less obvious what the filters that focus on ecological and social qualities (e.g., fairness, environmental protection, biodiversity) exclude. Research on process standards reveals that they tend to prioritize

professionalized, large-scale producer organizations because those organizations are better equipped and have the resources necessary to comply with the bureaucratic expectations concerning documentation and controls that come with filtering standards, thereby excluding small-scale farmers.

This exclusion of small-scale farmers by filtering and bureaucratically demanding standards has been observed in the Global North in the case of Austrian dairy farmers that follow animal welfare standards (Schermer 2022), whereas it is particularly prevalent in the Global South, where small-scale farmers find it challenging to adhere to bureaucratic standards (Mutersbaugh 2005; Coslovsky 2014; Renard 2022). A most illustrative example of the prioritization of large-scale producers and the marginalization of small-scale farmers is the fairtrade standard, which was originally designed to integrate disadvantaged small-scale farmers into global trade but often ends up benefiting well-established large-scale plantations that possess the necessary resources and capabilities to successfully pass the filter (e.g., Arnold and Loconto 2021). In line with this and with a focus on the use of the Globally Important Agricultural Heritage Systems of the FAO, which is designed to conserve traditional agro-ecosystems of cultural value, Sekine (2022) finds that these standards privilege grain-dominated monocultures rather than small-scale polycultures in Japan. Hence, from the perspective of existing filtering standards, small-scale farmers are often considered waste.

Thus, exclusion and waste are implicit components of order-establishing filters. By virtue of their either-or sorting, filters inherently generate waste, which manifests in varying ways, encompassing both human and non-human entities. As in the case of the lower ranks previously highlighted, there is also a possibility for filtered-out food and producers to find alternative uses elsewhere. However, from the perspective of filtering standards, what is filtered out is disvalued and considered worthless, which is why additional efforts are needed to identify these alternative applications (Star 1990).

Standards Divide

Divisions create order by dividing the objects of standardization into groups without imposing a hierarchy, as in the case of ranking standards (Busch 2011). In the realm of food, divisions typically manifest through variety and origin. The OECD (2020) standards for avocados are an example. In addition to the previously mentioned ranks, the standardization framework lists divisions that group avocados without providing any hierarchy. One such division demands the specification of the country of origin for each avocado

without providing further guidance on which origin is superior or should be prioritized. Another division requires the specification of the variety of avocado (e.g., Benik, Hass, Nabal, Ettinger, Fuerte, Pinkerton, Gwen, or Ardith) without arranging these varieties in a hierarchical order. These divisions simply divide avocados into groups.

Given that divisions merely serve to divide, they do not directly exclude and thus do not generate waste *a priori*. That is, from the perspective of the division, there is no judgement of which of the groups is better or preferable, but this neutrality vanishes abruptly when the standards are applied—be it by individual consumers, commercial buyers, or standard-setters. For example, a close examination of the OECD avocado standards indicates that in everyday food trade and consumption, divisions can be brought into a hierarchical arrangement. Specifically, the standard states that ‘parthenocarpic fruit [that develop without fertilization] and avocados for industrial processing [are] excluded’ (OECD 2020, 1), implying that these divisions are not even considered in the standard-setting. However, most often, buyers and consumers subject divisions to hierarchical ordering and prioritize a particular division, which can result in collateral damage for food producers. While the development of new, additional varieties can provide advantages and power to food producers (Legun 2017), a dominant division can exclude food producers from markets and value chains. An illustrative case is the pineapple industry, where Ghanaian producers faced difficulties cultivating a new, highly in-demand variety (MD2) sought after by supermarkets. When supermarkets and other buyers suddenly demanded almost exclusively MD2 pineapples, many Ghanaian producers who were cultivating other varieties were kicked out of the industry and exports plummeted (Arnold and Loconto 2021). When buyers and consumers hierarchize, divisions can disvalue food and the people and organizations that produce it.

Another illustrative example of how the application of divisions can generate waste is Russia’s ban on Western products in 2015. Russia took the origin of countries (i.e., division) as a basis to not only discard but also destroy food. While ‘the sight of vast amounts of banned foreign food being bulldozed, buried or burned [was] causing controversy in Russia’ (BBC News 2015), this ban illustrates not only how standards can be abused for political purposes but also how divisions can serve as a reason for waste. Furthermore, while use of the standards was criticized (e.g., the Russian government was reliant on divisions to identify Western food), there exists hardly any waste-based critique against the divisions themselves. This can be explained by the distinction between divisions, ranks, and filters in terms of their relationship with waste. While ranks and filters determine what they consider

waste (low-ranked and filtered-out entities), divisions remain unspecific and theoretically neutral, leaving users to decide what they mean. Consequently, users may become the object of critique, but divisions can continue to give the impression that they facilitate an egalitarian sorting of produce that does not generate waste.

Reactions to the Accentuated Critique of Standards

Thus far, this chapter has elaborated on the insight that standards exclude in various ways, depending on their type. Shifting attention to the reactions to the critique, we observe two distinct reactions that differ in their approaches to the use of standards. The first reaction, primarily driven by policymakers, perceives the development of new, additional standards as a solution. The second reaction, primarily presented by organizational food manufacturers, experiments by bypassing existing standards. Before elaborating on the differences between these reactions, it is important to note that both align with policies that call for a dramatic reduction in food waste and losses. Specifically, both reactions aspire to contribute to the United Nations Sustainable Development Goal 12.3 to reduce food waste by 50% by 2030. They do this by trying to retain and reintroduce in markets food that was previously excluded and discarded because of unmet standards. To do so, the first reaction focuses on introducing additional standards, whereas the second bypasses existing standards.

Setting Additional Standards

Following the critique that filtering standards, especially date labels, lead to food being discarded, support is growing for reconsideration of these filters. Given the confusion about date labels, policymakers are unsurprisingly calling for better consumer education regarding the distinction between ‘use-by’ and ‘best-before’ filters to promote more careful handling of household food (European Commission 2023). Interestingly, policymakers have also proposed new filters. In Switzerland, a working group comprising scientific organizations, food banks, and organizations from the food industry, all advocating for food waste reduction, developed the idea of a new filter (‘best-before+’) that sets a ‘timeframe beyond the ‘normal’ best-before date during which a product remains safe and edible when stored correctly; this

timeframe varies from an additional six to 360 days depending on the category' (Fenaco et al. 2021, 1, own translation). A similar proposal has also been put forth by the working group for the 'use-by' date, which is to be extended (by 90 days) when the food is frozen. Importantly, these new filters do not replace existing ones; rather, they are added alongside them.

The proposal to use additional standards to reduce waste is not limited solely to date labelling. Rather, there is a broader effort to develop new standards to reduce food waste. For instance, the certification standard called 'Upcycled', developed in 2020 by the Upcycled Food Association, filters upcycled products by certifying them (Upcycled Food Association 2020), while the Too Good to Go initiative awards the Waste Warrior Brand to those companies that contribute to bringing normally discarded food back into the supply chain (Too Good To Go 2021). In both cases, the new standards function as filters, either filtering companies that manage food waste (Too Good to Go) or filtering products made from waste materials (Upcycled products). Again, these new standards are added to the existing web of standards.

In addition to standards that aim to bring discarded food back into markets and supply chains, an international standard has recently been launched to reduce food waste. The 'Food Loss and Waste Accounting and Reporting Standard' was developed in a multi-stakeholder partnership and published in 2016. It 'provides requirements for countries, companies, and other entities for reporting on FLW' (food loss and waste) (WRI et al. 2016, 7) and has a mission to 'promote their adoption so entities are better informed and motivated to take appropriate steps to minimize FLW' (WRI et al. 2016, 5). The idea behind this is that the collection of harmonized data on food waste can make policymaking more effective. Therefore, the motive for the development of this standard does not solely lie in food wastage, but in the fact that 'there are still no internationally used standards, concepts, or definitions of food loss and waste' (FAO 2019, 120). While it remains to be proven to what extent standardized data collection can contribute to reducing food waste, this development suggests a shift in standards—from being a means to an end (reduction of food waste) to becoming an end in itself.

Generally, the idea of setting additional standards to reduce waste is widely institutionalized. In fact, waste is part of conventional standardization frameworks. For example, Pauliuk (2018) cites the British Standards Institution (BSI), which found in 2013 that 'more than 200 standards related to specific areas of waste prevention and resource management'. An example is the environmental management standard ISO 14,001, which requires a waste management system as part of overall environmental management (ISO 2015). What is common to these attempts to combat waste through standards

is that the policymakers consider waste as a given, have a clear and precise understanding of what waste is (not), and pay little attention to the social construction and contingency of waste stressed by social scientists (Gille and Lepawsky 2021; Liboiron and Lepawsky 2022). Approaching waste as a given not only reproduces a limited and pre-given understanding of what is considered valueless but also neglects the fact that waste is socially made and contingent (Arnold and Dorn 2024).

Additional standards that lead to a measurable reduction in food waste could serve as an illustration ‘that standardization can lead to the betterment of life’ (Timmermans and Epstein 2010, 83). Such improvement could unfold on a large scale because standards, due to their abstraction and generalizability, can be diffused and applied across various contexts (Brunsson and Jacobsson 2000; Gustafsson 2020). However, the fact that problems triggered by standards require additional standards raises doubts about their efficacy. Standards exclude and discard, which is not what they are intended to accomplish. This is why some try to bypass them.

Bypassing Standards

The second reaction, which aligns with the first in terms of goals but diverges in terms of the use of standards, is the bypassing of standards. While others have studied the bypassing of food standards with a focus on the values it creates for communities (Lehtonen and Pyyhtinen 2021 emphasize the related practices; Zapata and Zapata Campos (2025) highlight the creation of new, related common spaces), I draw upon insights from my empirical study of three organizational food manufacturers that garner high admiration in the field by circumventing existing standards and reintroducing food waste into conventional consumer markets (Arnold 2021, 2022). Specifically, the three organizational initiatives transform discarded food into marketable products. The first initiative creates jams from fruits that cannot be distributed by food banks, the second purchases deformed vegetables from local farmers to make bouillon, and the third processes all sorts of agricultural produce that cannot be sold conventionally (e.g., deformed fruits and vegetables, soup chicken, products that have passed the ‘best before’ date) into catering appetizers. When processing food waste, all three initiatives ignore the aesthetic ranks imposed and formalized by retailers that demand certain sizes, colours, or shapes of food produce. This bypassing allows the initiatives to repurpose food that would normally be excluded, but it necessitates that they seek alternative methods to assess the quality of the food.

All three initiatives replace abstract, formalized standards with the use of sensory experiences to evaluate discarded food. This means that employees and volunteers evaluate the food's quality situationally. In all three cases, individuals visually inspect slightly damaged fruits, manually remove the affected parts, and process produce that is too small or misshapen. However, findings demonstrate that substituting aesthetic standards with sensory-based assessments alone is not sufficient to bypass standards and reintroduce waste into consumer markets: all three initiatives buy and use additional conventional food ingredients to process food waste into new products. For example, the production of jams requires sugar, whereas bouillon requires the addition of salt. Furthermore, each initiative creates new devices that support the bypassing of standards by aiding consumers in judging the new products. These devices include labels and posters that clarify that the products on offer do not meet conventional standards and are crafted from food waste, thereby contributing to the reduction of waste. Given that the end products do not align with standardized consumer expectations, providing these clarifications is crucial to consumers perceiving products made from food waste as valuable options. Hence, bypassing standards is an elaborate endeavour that supports the maintenance of existing standards—in the process of bypassing, the established standards serve as an explicit point of circumvention.

Nevertheless, the bypassing of standards practised by food waste manufacturers indicates that alternatives to standards are indeed viable, albeit demanding endeavours that unfold situationally and are labour intensive. In this vein, two out of the three food waste initiatives I studied depend on volunteer labour, while the food waste catering initiative explains that they must price their products relatively high to compensate employees who undertake all the necessary work to process non-standardized, discarded food so that it can be reintroduced into food markets. In this regard, one can observe that the bypassing practised by these initiatives is challenging to scale and primarily exerts a strong local influence. While the initiatives tend to cater to alternative, local selling points, the initiative producing food waste bouillon has recently managed to additionally distribute its product through conventional supermarket channels.

The bypassing of standards could be regarded as a radical reaction to the critique of standards because it demonstrates that food markets and quality assessment can be organized differently than via abstract, formalized standards. However, it is crucial to acknowledge that the absence of formalized standards can also cause harmful waste, as demonstrated in the case of animal agriculture and meat. Specifically, WWF writes that 'drivers of food waste include poor sanitation during milking leading to diseases [...], poor

standards of animal husbandry resulting in high livestock mortality rates, and fishing techniques that result in significant bycatch and discards' (WWF-UK 2021, 15). Consequently, 'improved animal welfare standards in relation to rearing and slaughter, which includes improved transportation from farm to slaughter, could reduce farm-stage waste' (WWF-UK 2021, 19). Of course, a critical perspective on standards prompts the question about the exclusionary nature of these welfare standards, and we know from Schermer (2022) that small-scale farmers are probably impacted. This highlights the dilemma that comes with standards; while they consistently exclude and discard, a lack of standards can be fatal.

Standards and Waste: An Intricate Relationship that Refines and Propels the Critique of Standards

Efforts to critically question standards and standardization began gaining momentum two decades ago. With the aim of feeding this critique, this chapter has illuminated the relationship between waste and standards in the context of food systems through a systematic examination of the waste-centred critiques directed at standards. Regardless of whether standards establish order through hierarchization or filtration, or when divisions are applied in practice, standards provoke exclusion, generating waste that sparks critique of standards as well as reactions to mitigate and reduce the waste. These reactions involve bypassing existing standards and suggesting new, additional standards. I conclude this chapter by discussing how these reactions further propel the critique of standards, but first, I summarize how considering the standards–waste nexus helps specify the exclusions made by standards.

The waste-based critique refines our understanding of the exclusionary effect of standards by demonstrating that standards do not uniformly exclude. Filtering and ranking standards explicitly exclude what is filtered out or low-ranked and therefore become subjects of critique. In contrast, dividing standards, while seemingly neutral and not exclusionary by nature, are considered less problematic. Therefore, the critique is directed less at the dividing standards themselves and more towards those who apply and hierarchize the divisions. In any case, the waste-based critique of standards helps challenge the everyday perception that standards are desirable and advantageous (Timmermans and Epstein 2010) by clarifying that standards not only promise and ensure quality, values, and efficient coordination but also generate waste in different standard-dependent ways. Waste thereby serves as a

tangible means of specifying the excluding nature of standards and naming what is excluded. In the case of food standards, the dominant critique pertains to food waste and marginalized small-scale farmers. However, there are also indications that food standards not only affect food and the producers behind them but also animals—an aspect that will require further exploration to fully account for the multiplicity of waste, which could also encompass disvalued areas, knowledge, and practices (Liboiron and Lepawsky 2022).

More crucial than the nuances of these exclusions is the insight that the waste excluded by standards rebounds, provoking the development of new, additional standards that aim to mitigate the undesirable consequences of the earlier standards (i.e., waste). I discussed the addition of standards as the first and prevailing reaction to the critique of standards because the conception of standards as solutions to a problem they themselves cause is not a surprising assertion. Standards exhibit a tendency to escalate and multiply (Brunsson and Jacobsson 2000; Gustafsson 2020; Arnold and Loconto 2021), and waste plays a dual role in fuelling this notion of ‘fighting standards with standards’ (Mutersbaugh 2005)—both a consequence and a catalyst in the proliferating multiplication of standards.

In addition to the creation of additional standards, this chapter has revealed that waste-based critique is also met with a reaction that consists of bypassing standards. Given the avoidance of standards, this second reaction could be considered ‘radically innovative’ (Clougherty and Grajek 2023). Yet, a closer examination reveals that this bypassing is not fully independent of standards; rather, it is built upon an explicit orientation towards existing standards, highlighting how they are bypassed. In this sense, not only does the addition of new standards (the first reaction) drive the pervasiveness of standards, but also the bypassing (the second reaction), as it relies on standards to circumvent them. Hence, any reaction to the critique of standards seems to drive and reinforce them—a continuation that persists because of the exclusionary nature of standards, which manifests in the ongoing generation of wastes and reactions thereof.

This critical analysis of the intricate relationship between standards and waste should not conclude that ‘standards are useless, or done without’, as Susan Leigh Star (1990, 52) has already clarified. Instead, it calls for a reflective stance towards standards, accounting for and reflecting on waste that otherwise remains implicit. The lack of such reflection is evident in the fact that policymakers aim to reduce food waste caused by standards by introducing new, additional standards. As briefly outlined, part of this burgeoning landscape of standards is the Food Loss and Waste Accounting and

Reporting Standard, which has emerged largely unnoticed and provoked little critical scrutiny. While the few extant critiques focus on identifying gaps, such as the observation that the standard ‘does not give clear guidance on how to distinguish these two categories (edible and inedible) for food waste in the home’ (UNEP 2021, 87), a critical perspective, as advocated in this chapter, does not accept such unreflected proliferation of standards; one who adopts a critical stance towards standards cannot be satisfied with simply leaving the situation as it is. Rather, they must express their concerns by asking specifically who and what is excluded by the standards, breaking with the unquestioned belief in standards, and advocating for change and improvement.

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From Refuse to Refusal

Disrupting Racial Capitalism's Wasting Relations

Marisa Solomon

Introduction

Living and doing research in the United States, it becomes clear that where landfills are sited exposes the long *durée* of racist economic enclosures. Landfills are a geographic method by which surpluses—of life, land, and matter—are annexed by and for capital. Predicated on a logic of disappearance, the landfill's 'absential' technique (Reno 2016, 216) obfuscates a violent spatial reality: that devalued Blackness is the place of waste in the United States. Though images of landfills, such as photos of New York City's Fresh Kills Landfill, or scenes from the film *Waste Land* (2010), set in Jardim Gramacho, the world's largest landfill on the outskirts of Rio de Janeiro, are often circulated to promote the importance of recycling and remind a global public that their waste does accumulate *somewhere*, these images have yet to produce a basis from which to interrupt the geographies of environmental control and wasting relations of racial capitalism's material realities.¹ It is for this reason that I want to suggest that we stop seeing the landfill as a site of managing consumption's 'end' and instead see the landfill as pedagogical: a technique producing, if not naturalizing, waste as a condition of racial dispossession. Rather than dwelling in the landfill's technocracy,² I'm concerned with the material realities that the landfill socializes: racial capitalism requires the spatial containment of social death. By dwelling here, with waste, I hope to locate practices, places, or relations that *disrupt* what the landfill teaches: that waste, produced under racial capitalism, can ever be contained 'out of sight and out of mind'.

¹ For more on Jardim Gramacho and the catadores (garbage pickers) in Brazil see Kathleen Millar's *Reclaiming the Discarded* (2018).

² For two excellent ethnographies that focus on the social work that adheres in the technocratic maintenance of landfills see: Joshua Reno's *Waste Away* (2016) and Sophia Stamatopoulous-Robbins's *Waste Siege* (2020). For more on technological zones see: Andrew Barry's 'Technological Zones' (2006).

This chapter offers a way to see waste not as a stable object but as a horizon of critique and a field of power from the perspective of dispossessed Black life as it takes shape under racial capitalism in the contemporary United States. I centre Blackness to think about racism as productive of wasting relations, and wasting relations as productive of anti-Black racism. Chattel slavery, the foundation upon which racial capitalism is built, was also the logic through which Black life became disposable. Both invaluable to and devalued in pursuit of a white planter class's economic and environmental control, 'Black' became a contradictory racial status that racial capitalisms scholar Charise Burden-Stelly describes as the 'condition of value minus worth' (2020, 10). To put it differently, 'Black', as it appears in this piece, describes an irresolvable *condition* and relationship to value production, one in which anti-Blackness is, to invoke Armiero (2021), a wasting relation that discards—wastes—Black life in the United States (and globally).

Power *wastes*. As Max Liboiron and Josh Lepawsky theorize, for systems of domination to persist, they must discard (2022, 62–96). And racial capitalism is a political and economic system that discards in order to produce value. While for some scholars 'race' is ancillary to the class antagonisms of capitalist social relations, for scholars of racial capitalism, race marks a *structural* 'relationship to the capitalist mode of production. . . and the condition, status, and material realities emanating therefrom' (Burden-Stelly 2020, 10). As Cedric Robinson once argued and Burden-Stelly reminds us, racial capitalism describes *how* 'the development, organization and expansion of a capitalist society pursued essentially racial directions' (Robinson 2020, 2; Burden-Stelly 2020, 8). And when it comes to waste, these 'racial directions' are indispensable to the enduring 'infrastructures of appropriation and dispossession' (Singh 2017, 30). Public housing complexes, prisons, jails, and detention centres are often sited atop superfund sites and in proximity to particulate matter from waste to energy-facilities; highways map directly onto historical patterns of segregation. The likelihood that marginalized communities live close to a landfill increases with poverty, indexing the racial and economic geographies of exposure to contaminated groundwater, lead and legionella, and hazardous material at work (Bullard 2019; Lawson 2001; Mills 2001; Checker 2005, 2020; Sze 2007; Taylor 2014).

While violence, including environmental violence, against poor people of colour the world over persists, less obvious are the persistent racial-spatial fantasies of *containing* all that is a threat to capital. Under conditions of racial capitalism, containment subtends racialization by treating Black life as a 'threat' at the same time that containment is the primary strategy for

mitigating the environmental risks of racial capitalism. In both cases, however, containing ‘hazards’ is more social fantasy than it is an effective strategy for managing racial capitalism’s wasting of land and life. The landfill is one such fantasy, in which the technocratic prowess of modern sanitary landfills sublimates the centrality of race to the colonial project of environmental control. As such, it directs us away from what Marco Armiero argues is the central problem of racial capitalism’s environmental realities: ‘wasting relationships’ produce premature death. Shifting our attention away from the place of waste (the landfill) Armiero argues, ‘waste is not a thing to be placed somewhere’; rather it is a problem of ‘a set of wasting relationships’ that ‘produc[e] the targeted community’ (2021, 2). To put it differently, I read Armiero’s intervention as a reminder that disposability is an uneven *condition* of racial capitalism; one that produces racialized dispossession elsewhere as much as it produces a racial *here* and *now* of environmental control.

In this piece, I will first think through the spatial logic of racial capitalism to show how ‘disappearance’ is racial, materializing environmental control through white supremacy. Second, I will offer examples of how Black houseless people refuse wasting relationships, suggesting that the material realities of waste (not just in the landfill) are a place from which to critique racial capitalism. Finally, I will turn to the question of refusal, to think through what refusing to be wasted has to offer an analysis of racial capitalism in the United States and point to some implications for racial capitalism’s global impacts.

Containing Hazards

Racial capitalism’s need to contain its own environmental problems produces the persistent need for disposable life and disposable land. The science of land use that ‘manages’ the discrete zones through which hazards are emplaced simultaneously relies on, and sublimates, race as a structural relationship to capitalism’s spatial and material needs (i.e., to *place* waste). However, it is waste’s emplacement that both produces dispossession and makes dispossessed people seem *as if* they are the waste problem themselves. This contradiction reveals the ‘racial’ in racial capitalism to be a waste condition—or rather, waste is part of the material reality of what Ruth Wilson Gilmore describes as ‘group differentiated vulnerability to premature death’ (2007, 247). The logic by which dispossessed people become vulnerable to the death-dealing logics of capital is a racial one; the ability to discard or dispossess through toxicity, contamination or waste accumulation requires

devalued land and life to service capitalism's self-devouring ends. The attendant geographies of concentrated environmental risk index how enclosure becomes the primary form through which hazards (waste and racialized people) are managed.

As viral videos of state-sanctioned harassment, brutality, and murder continue to show, Blackness is managed as a hazard that needs to be contained. In her incisive article 'For Peace and Quiet', Teona Williams argues that anti-Black violence is intertwined with socio-environmental processes, namely the planning and maintenance of cities. When 'violence is a form of environmental control', the state-sanctioned murder of Black people *for peace and quiet* operates alongside other forms of state violence and displacement, removing Black people from public spaces, particularly parks (2021, 498). The spectacular, yet all too normalized, display of Black death is, environmentally speaking, about land in which containing Black life (through slow and quick death) is justified by colonialism's *land uses*. As Max Liboiron reminds us, 'Pollution is about maintaining differentiation through appropriation and access to land, about keeping it reserved for settler colonial goals and unavailable for other land relations. So too is shooting unarmed Black, indigenous, and people of color' (2021, 77).

Violence against people of color is a land management strategy and so too are landfills conveniently concentrated near people of colour. Landfilling, capitalism's most popular waste management technique, is the most inexpensive form of waste management as long as land and people of colour are chronically *disposable*. Waste management is 'the cultivation of a containment system based on assumed ontologies of separation' (Liboiron 2021, 75). 'Practices of waste management' that do not abide by this logic of containment ironically become evidence of people who *waste*, and thus who need to be managed *as* an environmental hazard (Liboiron 2021, 75). The colonial land relations that make this possible presume that living in other ways, living that values other kinds of socio-material relations, are in need of improvement, management, or modernity (Wolfe 2006; Hosbey 2018; Millar 2018; Solomon 2019; Liboiron 2021; Roane 2018; Roane 2022). The paradox, of course is that, 'recovering what has been wasted' within colonial capitalist paradigms of waste management, itself extends the logics of wasting (Armiero 2021, 55).

Material Recovery Facilities (MRFs), such as bottle redemption centres and waste-to-energy plants, which underpin sustainability goals such as zero-waste campaigns, do not seek to interrupt the *social* relations that *waste*; instead, they become part of the logic of wasting. As Samantha MacBride theorizes, recycling is a deceptive solution to the problem of waste, least

not because part of what constitutes recycling in the United States is shipping certain materials overseas (MacBride 2012) to be sorted *elsewhere*. The bodies and labor of people of color ‘elsewhere’—be it the people of colour forced to live with the particulate matter generated by waste to energy facilities, or the migrant and feminized labour of ‘sorting’ (Chen 2009)—become the infrastructure for the economies of wasting the world over.³ Thus, this ontologizing of separation, to borrow from Liboiron again, is not an environmentally sound response to pollution and wasting relationships; rather, it is a way in which racial capitalism tries to save itself *for itself*.

Ruha Benjamin argues that ‘race [i]s a form of technology—the sorting, establishment and enforcement of racial hierarchies with real consequences’ (2019, 54); technological fixes to social problems encode power into our techno-utopic dreams. Wasting is primarily a *social problem* with real material consequences, and the landfill, the technology we use to contain those consequences, cannot interrupt that problem. My argument is not about the landfill per se, but rather, what its existence teaches us about social relations, including that to be distant from waste is *always environmentally sound*. Landfilling is based on the infrastructural logic that the hazards of a propertied way of life can be contained. However, ‘what radically challenges the wasteocene logic is commoning as a practice, because it creates a different set of relationships based on reproduction and recognition rather than exploitation and obliteration’ (Armiero 2021, 55). There are other ways of living with waste that are all too often defined as *mismanagement*. Perhaps this is reason enough to consider those other ways of living—those ways of being that threaten wealth, and the tastes, aesthetics and fantasies of hygiene that stabilize the moral ideologies of society’s most powerful and *wasteful*—as a place of critique, a place squarely in the waste.

From Refuse to Refusal

As we loaded used bottles into a cart, Terran, a Black houseless man quipped, ‘How could what I do be a crime?’ In 2016, under the direction of the Mayor, the New York Department of Sanitation (DSNY) began to clamp down on

³ Scholars of infrastructure have theorized how infrastructure upholds hierarchical social systems (Von Schnitzler 2016) as well as how they materialize new spatial orders (Collier and Lakoff 2008; Cowen 2014). Scholars have also looked to the way that people act as infrastructure (Simone 2004), how their labour becomes infrastructural (Elychar 2010; Gidwani and Mariganti 2016), and how community care work diagnoses the failure of systems, bringing a feminist attention to the way infrastructures and lack thereof facilitate or interrupt social reproduction (Truelove and Ruszczyk 2022). Infrastructural failure, too, opens up the possibility to see the necessity of experimental modes of living (2018) and creative forms of socio-technical practice (Larkin 2008) that respond to infrastructural failure.

the crime of recycling theft, ostensibly to increase recycling rates. The DSNY even posted a video that sought to popularize the idea that ‘Recycling is the law. Scavenging is a crime.’ Doubling down on the idea that poverty is antithetical to environmental behaviour, or rather, that the *poor* are an environmental problem themselves, the video’s ominous voiceover ends with the decisive phrase: ‘Don’t allow scavenging to steal recycling’s future’ (Nir 2016). Terran, a houseless Black man scavenging the streets of Brooklyn, is articulating the precise nexus that Charles Mills identified as how Blackness becomes an environmental problem (Mills 2001, 80; Wright 2021). ‘The only thing that I know is true is that this world doesn’t believe I have the right to my own life. I’m homeless, so what?! I ain’t hurting no body!’ For Terran, making life with waste is a labour of living and a form of refusing. For the DSNY, Terran’s labour, his work of survival, is a *crime*. Within the geographic mandates of racial capitalism, the discarded living of Terran and others is a threat to a white environmental future.

My ethnographic work did not primarily rely on ‘expert knowledge.’ Less interested in the way expertise within these systems reveal contradictions or inconsistent theories,⁴ I was taken in by how discarded living experiments with waste’s form and meaning (Solomon 2025). If wasting relationships are the social relations of racial capitalism that need to be interrupted, then it is within discarded living—those surplus populations and their attendant geographies (Shaw and Waterstone 2019)—that knowledge about refuse is also knowledge that *refuses*. In other words, I learned how to gaze back out from the standpoint of dispossession, and more importantly, to see dispossession as an environmental *standpoint* (cf. Samson 2015). Within the trajectory of feminist thought, standpoint shifts our attention to everyday practice, and, as I argue, to see dispossessed people’s experiences and living as environmental knowledge. If waste management, to draw on Joshua Reno again, does not so much mitigate risk as much as it ‘concentrates [risk] elsewhere’ (Reno 2016, 23), then the critiques that my interlocutors afford are ways to refuse the corollary argument: that the *here* and *now* of racial capitalisms waste management practices are ecologically sound.

⁴ Many ethnographic projects that focus on infrastructure reveal these inconsistencies. For example, in Sophia Stamatopoulou-Robbins (2020), she shows how environmental ethics within a colonial situation can become double speak in which indigenous people “share equally” in the blame of the toxic intimacies of colonialism. In a different context, Chahim (2023) describes the contradictory work that waste engineers are marshalled to do to ‘protect’ the environment when the logistical work of making waste water flow requires funneling waste water through poor Mexican neighborhoods in order to protect neoliberalism’s self-devouring growth in Mexico City. (For further reading see: McKee 2015; Butt 2020; Resnick 2021.)

Terran was part of a larger crew who sometimes called themselves scavengers and sometimes called themselves hustlers.⁵ The many names they chose for themselves always pointed to the structural conditions dispossessing them and how their labour responded to those structures. As Terran said to me, ‘I’m doing the labour that city doesn’t do itself. I’m the one cleaning up this damn city and yet, I’m also being blamed for it not being clean.’ This reframe of his labour as what the city doesn’t do itself is in direct opposition to the way normative discourses of recycling try to interrupt ‘wasting relations’ by presuming that you can annex waste by and for racial capitalism. In an article for *Resource Magazine* pointedly titled ‘Stealing Recycling’s Future’, Robert Lange argues, ‘when establishing and maintaining costly government services, there are many tangible realities that must be addressed. In the case of recycling, it makes no sense to provide household collection service and then allow the efficiency of that service to be undermined daily by relinquishing control’ to scavengers (2012, 26). In his not-so-subtle diagnosis, the efficiency of environmental control is not only logical, the scavenging that undermines its success is a threat to environmental order. Given that scavengers are not only being accused of stealing *recyclables* but stealing *the future*, criminalizing scavenging begs the question: whose property is trash anyway? (Zapata and Zapata 2025). *New York Times* reporter Sarah Maslin Nir writes, ‘Once refuse hits the curb, it becomes the city’s property—and the city’s problem’ (2016). But, if refuse on the curb is really the city’s *property*, then why is littering a finable offence, as opposed to a municipal-property-generating behaviour?

This inconsistency reveals the recursive nature of whiteness to redirect the law for the health of capital. The colonial apparatus that declared settlers ‘first possessors’ enshrined white supremacist theft into environmental law. Distance from hazards has become waste management’s profit structure, where devalued lands protect the accumulation of capital, and the laws that govern environmental protection construct what Cheryl Harris calls a ‘vested interest’ in whiteness (1993). If, as I mentioned above, containment is a racial logic for distancing ‘hazards’ from private property and the health of capital, then the landfill’s spatial fix constructs whiteness as a form of property that inherits healthful environments. Non-whiteness, the inability to own property, and ill health become suspicious, and making life with waste downright criminal.

⁵ My interlocutors called themselves scavengers and the work they did scavenging. This contrasts with informal waste workers elsewhere, who have rejected the term as derogatory (see Samson (2009) as well as Samson’s contribution to this volume). In this piece, I follow my interlocutors’ self-ascription; a full consideration of the political conditions under which some informal waste workers reject the term is outside the scope of this chapter.

In turn, surviving racial capitalism's wasting of Black life is itself an environmental refusal. Terran's 'crime' is thus an interruption to racial capitalisms' ongoing theft of land and life.

Viewing the living of surplus populations as *criminal* obscures how recycling extends racial capitalism's ability to annex waste as a commodity for itself. Though Lange's *Resource Magazine* article does incidentally acknowledge that a rise in scavenging 'has accompanied a dramatic downturn in the country's economy [and] high unemployment', he maintains that scavenging is *not* a 'victimless crime' but rather a crime against the environment (2012, 28). A spokesperson for the DSNY made this clear in a statement made to the *New York Times*. 'The city's got goals' and the way to make those goals *an environmental priority* is to frame them in opposition to the city's unhoused Black and immigrant scavengers. 'The only way to meet those goals is if we have control over the commodity', the spokesperson continued (Nir 2016), and by charging scavengers as a roving band of anti-environment criminals, poverty itself is construed as a criminal threat to a sustainable future.

'People up there in their clean houses can't survive what we survive, they don't know what this life is like. They're so scared of things being taken away, that they hold so tight to a life that's fragile and in the end—and I mean, the end of days—they'll waste away running from the dirt', Sal said to Marty. We were on a street corner in Brooklyn, not too far from new construction, that, like all the other construction over the last few years, looked the same. Clean lines, one colour, Black-framed windows, twelve storeys. Sal had been ruminating on how the aesthetics of the neighbourhood were becoming redundant; everything was starting to look the same. 'Not just the buildings', he said, 'the people too.' Marty, one of the other scavengers in this Brooklyn crew, disagreed. For Marty it was not so much the redundancy of the character of the buildings that seemed to be replacing where he had lived so many lives, what bothered Marty was the city's evident commitment to protecting the sanctity of the environment of 'these little white kids'. In Marty's words, this commitment to clean and white property contradicted environmentalist goals: 'See, I don't think about it like that, Sal. I think that these little kids, raised in the suburbs or some shit, spend their lives afraid that the dirt will get inside. They need things to be just right, and just so. But what will really kill them, the thing that will actually *get them killed* is this obsession with "fixing" the environment. They aren't fixing things. They make it worse. Hellllloooo, climate change anyone?'

This conversation is a poignant example of what Donna Haraway calls situated knowledge (Haraway 1988) or what Black and Marxist feminists

call standpoint theory.⁶ Situated within the heteropatriarchal racial capitalist relations of wasting, Marty and Sal are themselves refuse—the excess that cannot be incorporated into the aesthetics of gentrification and a threat that must be contained. But they are also scavengers who make life with the excess materials of gentrification, whether that is recyclables in the bin or scavenging places on the precipice of demolition. From here—squarely in the waste—society looks different, and the environmentalism that seeks to save capitalism from itself looks illogical. For Sal and Marty, racial capitalism's 'interventions' into the environment *make waste*; yet to new residents of Bed-Stuy, and even to the DSNY, Marty's and Sal's existence is an environmental problem. More than critique, Sal and Marty work together to craft new object relations, material relations that gentrifying residents in the neighbourhood find inappropriate and deplorable.

Brooklyn scavengers often dig through public trash bins as well as private ones. Sometimes looking for food, sometimes looking for bottles, always looking for things that facilitate life despite the fact that others have deemed them 'useless'. Unfortunately, more often than not, people call the cops on scavengers, with the ironic explanation that '*my trash is my property*'. Though it might be an interesting thought experiment to play out the question, *is trash property?*, I want to situate this comment in the crucible of racial capitalism's wasting relations. Under racial capitalism, 'Blackness', Burden-Stelly argues, 'is a capacious category of surplus value extraction essential to an array of political economic functions, including accumulation, disaccumulation, debt, planned obsolescence and absorption of the burdens of economic crises' (2020, 10). This means that Black people are structurally subjected to the entire range of economic functions that suit capitalism's needs. If disposability, however, is part of the contradictory condition of being Black, then, it is also from the position of being discarded, that the matter and meaning of refuse, rubbish, and waste are reworked from the margins.

When I first began this research, I also began volunteering at an electronic waste facility in Brooklyn. I was eager to learn if sorting practices could meaningfully intervene in waste management systems and electronic waste was, in 2012 when I began this work, of great political concern. However,

⁶ Standpoint theory has many tributaries, including Nancy Hartsock's (1983) and Sandra Harding's (1986, 1992) notion of strong objectivity, that sees the everyday experiences of marginalized people (specifically working-class women) as a material starting point for critical inquiry into class-relations. By generating questions from these experiences, more objective knowledge might be produced about power, often deemed irrelevant by dominant or hegemonic discourses about 'objectivity'. Also there are the Black feminists who insist that Black women's standpoints reveal even more about how matrices of domination work (Davis 1983; Crenshaw 1991; Lorde 1984; Collins 2009; hooks 2015) given the way race, class, gender, sexuality, citizenship, and ability intersect specifically on their bodies and compound the effects of oppression in their lives.

I quickly learned that sorting facilities don't necessarily interrupt the social problem that is wasting. In fact, they extend it. The e-waste facility was a warehouse where anyone could bring broken, unused, or old electronics. While the facility did attempt to create a resale shop, primarily it was a storage house for waste. As a volunteer, my job was to stack electronic waste onto pallets, wrap them in plastic, and load the pallets onto a truck so that they could be driven to facility upstate and shipped to another facility out of the country. This work of collecting, wrapping, shipping was the facility's primary function, and thus was not unlike most waste management systems that collect, sort, move, treat; as environmental scientist Vivian Thompson notes, trash is always on the move (2009). Within racial capitalism's global reaches, one might begin to wonder why this orchestrated containment is considered *management*, whereas forms of commoning, including commoning *waste* are considered unsightly, dangerous, criminal, a threat, and *mismanaged*.

The administrative management of the e-waste facility was primarily white, while those who did manual labour, including shipping and trucking, were primarily people of colour. Henry, one of the middle-aged Black men who worked in the back of the warehouse who had 'fallen on hard times from time to time', was not an electrician but knew his way around wires. 'I've lived in so many places with illegal wiring, problems with the electronics. You figure it out when you're poor. So yeah, I know my way around a thing or two.' When broken electronics would come in, he would open them up, see if they were really broken, or if, as Henry would say, 'they just needed someone to pay attention.' He fixed speakers, turn tables, TVs and gaming consoles, things that he would take home or give to friends and family. 'This is nothing nobody taught me. I learned because I had to learn. You know how it is, you don't got money for new this and new that, you figure it out some other way.'

While it's easy to hear Henry talking about making do—or worse, perhaps, it's easy to impose a resilience narrative on his labour—I want to insist on something else. The knowledge borne of vulnerability to dispossession makes you attentive to the objects around you. Henry's knowledge is not expert knowledge, and the truth is, as much as he taught me about fixing and building my own speakers (which I still prefer for my turntable over the Bluetooth speakers that are now all the rage), he couldn't fix everything. Yet, his knowledge of electronic objects and their obsolescence was borne of his social location as a Black working-class man whose precarity was equally conditioned by the criminalization and dispossession of Blackness. Henry's standpoint makes clear that knowing waste *here* is knowledge about how to refuse racial capitalism's insistence on Black death.

Refusing Wasting

What does power look like through the eyes of those discarded by it? How might waste, rubbish, and refuse—the material realities that emanate from the condition of disposability—offer a different kind of political horizon for those discarded by power? How might waste be, again, not an object, but a condition stabilized by structural relations, as well as a material sphere of critical engagement housing unacknowledged ways of knowing, being, and *refusing*? Refusing to be wasted is a critical stance from which to see what the landfill teaches: distance from waste is a mark of civility, property is clean, and the right to pollute are all forms of racial containment. It is a place from which to notice that *waste* is a condition of dispossession as much as it is the materialization of *possession*, and that the landfill is a colonial fantasy producing ‘the other’ as much as it is the practice of colonial land relations (Armiero 2021; Liboiron 2021). In this (long) moment of planetary crisis, where hopes of circular economies, too, are enrolled in the health and sustainability of racial capitalism, we ought to look sceptically upon the persistence of this colonial fantasy—a future in which the waste of wasting is somehow nowhere to be found—and instead, prioritize waste in our thinking, not to allow global corporations off the hook, but rather to better understand what we are in the midst of and the material realities that constitute our collective, if unevenly distributed, environmental horizon.

Following in step with Elana Resnick’s critique of how resilience has come to stand in for resistance, I want to instead focus on how refusing ‘attend[s] to both the systems of domination that necessitate it and labor involved in managing those systems’ (Resnick 2021, 9). Brooklyn scavengers insist that their labour is the labour of material diversion—diversion being the term that waste management systems use to describe the practice of diverting waste to MRFs (recycling facilities, waste to energy facilities, scrap recovery, etc.). But more than the labour of diversion, scavenging is a way of *living* in hostile environments. Identifying the places and objects *wasted* by racial capitalism affords the criminalized a way to hide—to forge secretive paths of movement and spaces of communion produced and simultaneously obscured by criminalization. The wasting relations that structure houseless lives demand that they *are the refuse* of capitalism. And yet, being in relation to the detritus, garbage, and trash provides an alternative environmental horizon in which *refusing* racial capitalism’s wasting-relations is knowledge *about* waste as much as it is fugitive knowledge disruptive to racial capitalism. Waste management systems, symbolically evoked by the ‘orderly pyramids and closed

cycles' (Reno 2016, 216) of recycling logos, do not convey waste as a social problem but rather position waste management as exemplar of technological mastery. Moreover, they rely on notions of control and containment, logics that undergird racism and land-use as much as they maintain violent regimes that discard. To invoke Reno's work on the landfills of Michigan once again, 'waste is not a passive leftover . . . not at object of technological mastery but something that represents our very failure to master things and surroundings' (2016, 216).

Zero-waste fantasies reflect a troubling environmental imagination. Either the waste—by which I mean the discarded people, objects and places—produced by racial capitalism magically disappears, or waste is enrolled in the stability of capital. Both narratives hold disposing-relations steady as an unquestioned way of life. Here, I am reminded of Walter Rodney's prescient 1978 critique of global racial capitalism's fantastical and fanatical desire to disappear the waste it produces *of necessity*. 'We know', he explained, 'that capitalism has been killing the environment in the process of expanding capital' (KONNECTIONS 2020). European environmental movements, he goes on to argue, may become powerful enough to *displace* the environmental effects of racial capitalism's wasting relations, but the elsewhere to which these effects will accumulate will be Black. Under these conditions, Blackness and Black people the world over become the repositories of waste; the task of scholars of racial capitalism and waste must be, as Rodney's was, not merely to theorize from the particularities of regional and national anti-Black waste infrastructures to the global system, but to *refuse* those wasting relations. In this piece, I have focused on Black scavengers in the United States, whose lives and experiences of waste are linked to and inserted within this global system, in order to illuminate some of the ways this refusal might take shape.

Refusing wasting, as I have tried to show in this chapter, is less about refusing *to waste*, and instead, points us towards where, when, and how we might amplify that which *refuses*, or in Tina Campt's definition, those practices that 'rejec[t] the status quo as livable and the creation of possibility in the face of negation' (2019, 83). Racial capitalism's production of waste and modern waste management systems alike make Black scavengers 'fundamentally illegible and unintelligible' as environmental theorists. Still, their insistence that waste is a place from which they know 'rejects the terms of diminished subjecthood' and uses 'negation as a generative and creative source of disorderly power to embrace the possibility of living otherwise' (Campt 2019, 83). The point here, for me as researcher and for you as reader, is to also *refuse*. To refuse the sedimented meanings of

refuse and the presumed moral imperatives of *cleaning and improving*. It is also to refuse seeing people who make life with waste as either resilient or degraded and instead to shift our attention to the wasting relations that make such *scenes* a -cene (Anthropocene, wasteocene, capitalocene, plantationocene). 'Refusal helps move us from thinking of violence as an event and toward and analysis of it as a structure' and perhaps most importantly, challenges us as theorists to 'champion representational territories that colonial knowledge endeavors to settle, enclose and domesticate' (Tuck and Yang 2014, 18).

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Grassroots Social Innovation of Waste Pickers as Critique of the Existing Social Order

Jutta Gutberlet and Isabella de Carvalho Vallin

Introduction

The intensification of industrial activity over time, which is driven by economic and technological unsustainability, had led to the global environmental crisis of climate change. Projections have indicated that extreme climatic phenomena, such as heat waves, severe droughts and floods, water scarcity, and the spread of disease, will be even more widespread, intense, and accelerated than previously predicted (IPCC 2022). The human intervention that is leading to climate change is directly linked to the existing social order, a construct permeating the fundamental structures of human society, characterized by complex networks of interdependence in relationships among individuals and groups, mediated by institutional systems and cultural norms (North, Wallis, and Weingast 2009).

Capitalism is an institutionalized social order that dominates most of the world. It is not merely an economic system but also a social arrangement that perpetuates and reproduces systemic inequalities and is inextricably linked to forms of oppression and exploitation, undermining the public sphere. Capitalist relations of production exacerbate disparities in income and access to resources and opportunities, contributing to the systematic marginalization of certain social groups. The logic of capitalist accumulation leads to the rampant exploitation of natural resources and to environmental degradation (Fraser and Jaeggi 2018).

It is important, in questioning this scenario, to focus on a just transition. In general, just transition is a set of policies ensuring a decarbonized economy with low greenhouse gas emissions, decent working and living

conditions, respect for human rights, and equal opportunities, provided in a fair manner (Rendon 2020). The transition must be fair and equitable, with due consideration for race, ethnicity, class, and gender, especially in the Global South (McCauley and Heffron 2018). The concept of a just transition is multifaceted, and it can be employed as a governance approach focusing on labor, justice, and sustainability (Wang and Lo 2021).

Employing a justice lens and recognizing procedural and distributive implications helps address social inequalities among urban residents. In the context of a just transition, it is important to note that the concept climate justice (CJ) is based on activism and socioenvironmental movements and linked to human rights, ethics, moral responsibility, and co-constructed collective action (Sultana 2022). Power relations are at the epicentre of the CJ perspective, as it considers the intrinsic intersection between social, political, and economic structures, taking into account underlying structural inequalities, disparities in vulnerability, and capacity to respond to climate change, such as in terms of the power asymmetries influencing the formulation and implementation of climate policies that perpetuate systemic inequalities (Sultana 2022). Grassroots social innovation is an important form seeking to break with the existing social order and proposing alternatives for a more just, inclusive, and equitable society. The grassroots approaches can be developed with respect to many different practices, from addressing housing, food, health, access to employment, and other inequalities to reducing poverty and improving community engagement (d'Cruz and Satterthwaite 2006; Ardakani 2007).

In the climate justice literature, grassroots social innovations are considered initiatives emerging from specific, urgent contexts and everyday routines (Smith, Fressoli, Abrol, Arond, and Ely 2017). Between scientific and technological knowledge, these initiatives incorporate traditional and popular knowledge and adopt resourceful practices to address local needs and problems. Many studies classify grassroots innovations as informal sector innovations (Cozzens and Sutz 2014; Sheikh 2018). Such innovations are the result of either a social movement (formed by organized individuals, groups, or nongovernmental organizations (NGOs) (Seyfang and Smith 2007) or of ordinary people who act outside of formal institutions to create innovative activities (individually or as groups) (Gupta 2013). Whatever the case, these initiatives seek to overcome poverty, injustices, and exclusion. While informality is not synonymous with poverty and inequality, poverty is in fact widespread in the informal sector, as well as in many formal sectors (e.g., small-scale farmer organizations or recycling cooperatives) and

a condition shaping many innovations from the grassroots (Cozzens and Sutz 2014).

Some initiatives contribute to setting trends and novel approaches to sustainable development, such as in the *appropriate technology movement* between the 1970s and 1980s, the *HoneyBee Network* in India, which started in 2005, and the *social technology network* in Brazil, from 2005 to 2011, with the purpose of promoting and adapting social technologies for sustainable development. These networks and social movements contribute to building greater awareness for the need to address systemic unsustainability and injustice, allowing some of the innovation to become scaled up and to contribute to the development of more appropriate practices (Seyfang and Smith 2007). To understand the process and results involved in such innovation, Cozzens and Sutz (2014) suggest focusing on developing an understanding of the actors, the roles they play, and the aims that they pursue to solve specific problems and to critique the existing social order, indicating that different forms and arrangements are possible. In this chapter, we will specifically discuss grassroots initiatives that are related to waste management and waste governance.

Worldwide, waste generation is growing at an unprecedented rate, and with it come complex environmental and social challenges and threads (Kaza, Yao, Bhada-Tata, and Van Woerden 2018). Grassroots initiatives are involved in waste management in many ways in cities of the Global South, from collecting waste for its final disposal to collecting recyclables and reusables for classifying and forwarding to the recycling industry or finding alternative uses and forms that can add value to these materials. Often, elaborate and thoughtful innovations are required to allow this work to proceed.

Particularly in countries of the Global South, organized and autonomous waste pickers are a major actor in waste management and constitute a main motive force to feed the recycling chain, adding new value to discarded materials (Kaza et al. 2018). These workers collect, classify, and sell a range of recyclable materials, salvaged from the endless, everyday garbage flow (Gutberlet, Carenzo, Kain, and Azevedo 2017a). They organize in different forms, including cooperatives, associations, networks, unions, federations, and other small groups or community-based organizations (Gutberlet 2015; Kain et al. 2022).

The literature recognizes several different frontiers where the visibility of the efforts waste pickers make can be increased. The environmental and climate contributions made by their work have been recognized in the

academic literature for several years (Dias 2016; Amorim de Oliveira 2021). The work of waste pickers reduces greenhouse gas emissions and saves energy while feeding the circular economy (Achtell 2013; King and Gutberlet 2013; Mesquita, Gutberlet, de Araujo, Cruvinel, and Duarte 2023). In addition, increased mobilization and networking have entered the leaders of waste pickers into the arena of current debates on climate justice and just urban transition. Their perspectives do not focus entirely but also encompass sustainable socioecological reproduction from within their vulnerable conditions of existence and reproduction (Akbulut et al. 2019; Rendon 2020).

The waste pickers' grassroots social innovations often go unrecognized as such by other actors in this field, who may consider waste pickers to be merely labour, not developers of technologies or innovators. Their experiments include technological, organizational, structural, and political changes made by the group, which resulted in different accomplishments. These include facilitating the work, increasing their income, reducing their occupational risk, improving the organization and management of the group, enhancing human relations, reducing intraorganizational conflicts, and questioning the bottlenecks and impacts that occur in production and consumption (Carenzo 2020). Here, we concentrate on grassroots initiatives that impact waste management and waste governance as examples of social innovation critiquing the social order. We analyse whether waste picker initiatives question the existing social and political order by proposing new perspectives and alternatives for dealing with climate change, environmental degradation, and global deficits in human well-being. We present examples from around the world, but we focus specifically on the experience of the Brazilian *catadores*.

In the following section 'Situating Waste Pickers', we review the organization of waste pickers and their innovative capacity in the waste sector, presenting practical examples of their work, highlighting the genuine improvements that are achieved through their transformation of their tools, spaces, and social relations. In the section 'Grassroots Waste Picker Movements', we present a discussion of the role that *catadores* play in the context of climate justice and alternative economic paradigms. Then we discuss overlaps between spaces and initiatives in which *catadores* innovate and challenge the social and political order and their prevailing interpretations. Our final section brings together the power of the arguments that *catadores* present in Brazil, demanding a social and political transformation of society, acting on the present climate and environmental crisis while also tackling poverty eradication.

Social Grassroots Actors and Their Innovations

Situating Waste Pickers

The work of waste pickers is a significant social contribution, reducing cities' carbon footprint (Kain et al. 2022; Wilson et al. 2008), recovering resources for recycling, improving the local environment, and creating jobs and income among the poor (Mitlin 2008). The actions of informal and organized waste pickers, youth groups, and others are co-producing basic waste collection and recycling services (Bovaird 2007).

In spite of their numerous contributions, waste pickers are among the most widely excluded, impoverished, and disempowered segments of any society. They are exposed to toxic materials (Zolnikov, Furio, Cruvinel, and Richards 2021), suffer from prejudice and stigmatization (Coletto and Carbonai 2023), are persecuted by police because waste picking is often illegal (Rosaldo 2022), experience difficulties in creating formal associations, lack access to official microfinance and funding opportunities (Gómez-Maldonado et al. 2023), are susceptible to price market oscillation and unfair competition, and are subject to exploitative relations with waste intermediaries (O'Hare 2020).

Their work exposes waste pickers to extreme weather, including heat, cold, rain, and wind. They are thus exposed to heatstroke, dehydration, headaches, fatigue, and heat rashes (Michael, Deshpande, and Ziervogel 2019). Dias et al. (2024) interviewed 93 *catadores* in Brazil. They found that 91 per cent reported experiencing at least one event related to climate change in 2022: 85 per cent experienced abnormal heat or heat waves, and 39 per cent were exposed to flooding, which often spread disease (e.g., leptospirosis), as consequence of the water contaminated by the urine of infected rodents. Heavy rain can damage storage facilities, soaking materials, resulting in significant work and income loss. Climate change's impacts worsen the health and livelihood of *catadores*, who already face financial and social challenges.

An important factor for understanding waste pickers is social inequality. Societies in the Global South are marked by historical processes of colonization. In the case of Latin America, slavery, exploitation, and oppression had consequences for social relations and for study and work opportunities for those of African descendant and for indigenous people, leading them to marginalization. This is evident in the case of Brazil, where most *catadores* are of African descendant (IPEA (Instituto de Pesquisa Econômica Aplicada) 2013). This shows that the work of waste picking is rooted in a structural social condition marked by inequality and reinforced by capitalism.

Catadores are not homogenous: they may be homeless, living in precarious conditions, unemployed, temporarily engaging in this work, or long-term *catadores*. These characteristics entail variations in their vulnerability and their access to resources and work tools, including bags and vehicles, such as carts, cars, vans, or small trucks for the collection. Similarly, there are cooperatives that have precarious infrastructure or no equipment at all, and there are others that have presses, scales, conveyor belts, trucks, and support provided through various partnerships with private sector organizations, NGOs, or the government (see [Figures 8.1](#) and [Figure 8.2](#)).

Grassroots Waste Picker Movements

Waste pickers' social movements have been established at different levels and in different regions over the past two decades. Examples of such movements are the following. International Alliance for waste pickers is a global platform. The Latin American Recyclers' Network (Red Latinoamericana de Recicladores) brings together different national movements and inter-regional representations for *catadores*. The Federation of Recicladores in Argentina (Federación Argentina de Cartoneros, Carreros y Recicladores) was created in 2011 and now forms part of the Confederation of Workers of the Popular Economy (Confederación de Trabajadores de la Economía Popular). There are also networks specific to certain cities that represent them as a whole, such as the Excluded Workers Movement in Buenos Aires. In Brazil, *catadores* are organized at the national level by the National *Catadores* Movement (MNCR), and there are many regional networks throughout Brazil conducting collective operations, including commercialization and negotiations among organizations of *catadores* (e.g., Rede Catasampa and Rede Verde Sustentável in the metropolitan region of São Paulo, Brazil) (MNCR Movimento Nacional dos Catadores de Materiais Recicláveis n.d.). Across Brazil, many *catadores* have been organized in cooperatives and associations. These grassroots initiatives and networks have developed into new social movements of the urban poor that, whether intentionally or not, are challenging the nature of the state, local government, and civil society (Brunhara et al. 2023). Using quantitative and qualitative indicators, it has been possible to highlight the pressures, states, potential impacts, and responses of these cooperatives to identify aspects that require improvement to increase their overall political impact (see [da Silva Guabiroba et al. 2023](#)).

The influence that social movements can have on public policy has been studied widely ([de Sousa Teodósio et al. 2013](#); [Abers, Silva, and](#)



Figures 8.1 Panel A and B Examples of the work of *catadores* at a cooperative in Brazil, Avemare, Santana de Parnaíba (photograph by the authors)



Figures 8.2 Workspace and tools of an autonomous *catador* in São Paulo, Brazil (photograph by the authors)

Tatagiba 2018; Mitlin 2018; Carlos 2020) and it has been shown how their actions bring demand from social groups such as the Brazilian *catadores* organization MNCR to develop decision-making arenas and sometimes to make important contributions to public policies, bringing new perspectives to the problems at hand. MNCR has been instrumental in the drafting of federal policies such as the federal waste management legislation, which forms an important example of how these change-oriented actions can be brought about by grassroots movements. The representatives of MNCR participate in public hearings, council meetings, and other political spaces (such as, e.g., the annual *Expocatadores* event, where *catadores* meet representatives of governments and industry to discuss their contributions to selective waste collection and separation) to voice their demands. Since 2010, supported by targeted government policies (the so-called *Pro-Catador* funding programme), *catadores* have engaged in reverse logistics and sectoral agreements, such as one concluded with Associação Brasileira da Indústria de Higiene Pessoal e Cosméticos (ABIHPEC), explicitly designed as partnership programmes between industry and waste picker cooperatives (Brandão 2019).

Unlike the standardized knowledge that is generated by donors and international organizations through best practices, which is easy to package and sell but difficult to replicate successfully in other contexts (Gutberlet et al. 2017b), these bottom-up, often South-to-South oriented networks bring locally developed, innovative, and flexible solutions, posing challenges to existing power structures and systems. While economic and security needs generally come first, after social and environmental rationales (such as the contribution that waste pickers make to a cleaner and healthier environment, the improvement of services in deprived neighbourhoods, which makes cities more inclusive, and the role they play as environmental stewards and agents of change) are often developed in parallel and are intertwined with basic material rationales (Gutberlet et al. 2021). This is an outcome of the organized *catadores* pressuring governments and society during the COVID-19 pandemic to be recognized as essential public service providers (Azevedo, Gutberlet, de Araujo, and Harada 2022).

Similarly, changes in legal frameworks resulting from the advocacy of *catadores* in Brazil and Argentina has opened windows of economic opportunity for these organizations. Among these are new environmental regulations in the Buenos Aires metropolitan region, whereby large waste producers are required to take responsibility for their waste, and waste picker cooperatives are encouraged to collaborate with waste producers to process waste and reduce the final amount that is disposed (Carenzo 2020).

Since 2010, the Brazilian national waste management legislation has held open the possibility for organized *catadores* to become official service providers and be remunerated for their selective waste collection; however, very few municipalities actively remunerate *catadores* for this public service because there is insufficient formal enforcement of the policy, and thus, *catadores* often remain at the margins. In the absence of any official enforcement measures to guarantee the application of this legislation, whether *catadores* are included from local waste management is dependent on the existence or absence of local political will.

Reverse logistics programmes are company initiatives taken in response to the recent requirements entailing the liability of producers of waste-generating goods, including hazardous waste and mass-consumer goods (Brandão 2019). Reverse logistics forces companies to demonstrate the destination of their waste, with the result of a push to increase recycling rates. This has created opportunities for *catadores* cooperatives in Brazil, such as in 2010 the 'Dê a Mão para o Futuro' programme of ABIHPEC and Recycle for Brazil (Reciclar pelo Brasil), financed by large manufacturers in the

food and beverage industry. However, these examples, as well as others from Argentina, show that such programmes incentivize competition with other players in the recycling market.

Finally, macro-scale global discourses, such as the solidarity economy movement, materializing through policies and crystallizing public administration structures, such as in the case of the creation of the Solidarity Economy Secretariat in Brazil and the Brazilian Forum of Solidarity Economy, resulted in funding being made available to strengthen these organizations (Talga and Lopes 2023). In 2007, the federal government established the CATAFORTE I programme, allocating it a four-year budget of approximately R\$60 million (US\$22.6 million) to support organized *catadores*, followed by a second CATAFORTE programme launched in 2010 and a third programme in 2014 (Rutkowski and Rutkowski 2015).

Grassroots Initiatives Tackling Social and Environmental Contributions

Organized waste pickers often rely on financial and technical support provided by NGOs, universities, and local governments for space, equipment, training, and publicity. However, changes in government, budget cuts, or project completion can lead to discontinuity. For informal waste pickers, it is particularly important for them to have official and controlled waste transfer points in which the waste that they collect from households is stored until the municipality removes it to landfills or recycling centres (Gutberlet et al. 2017b).

While there are some examples in Brazil of organized *catadores* being hired to carry out the collection and sorting of recyclables and provide environmental education, the numbers of such tasks are low, and the contracts generally have low value. In general, local governments do not recognize the social benefits of generating employment and income for marginalized populations to alleviate poverty, in particular with respect to black women, young people, and the elderly to create a more inclusive waste management (Velis 2017). Because there is no enforcement of inclusive waste management, few municipalities are committed to it. Generally, therefore, projects and initiatives to strengthen the activities of *catadores* are set up by the organizations of *catadores* themselves or by NGOs that recognize the importance of this group of workers. Table 8.1 shows examples of certain initiatives developed in Brazil.

The National Association of *Catadores* has a long history of conducting projects to benefit *catadores* associations and cooperatives, whether by means of projects funded by public calls or through reverse logistics agreements concluded with the private sector. In recent years the organization has been developing projects that also benefit self-employed *catadores*. The Citizenship Hub initiative is seeking to provide social and political assistance, and it will also offer leisure and cultural activities, particularly to strengthen autonomous workers. It is important to expand the collaboration between organized and self-employed *catadores*, as the former often have difficulty obtaining recyclable materials, and the latter have difficulty obtaining a fair price. One example of such a collaboration can be seen in the Cooperative of Independent Collectors of Paper, Scraps, and Reusable Materials, which purchases recyclable materials from around 20 independent workers and offers fair prices (see [Table 8.1](#)).

Pimp my Carroça, a nonprofit NGO, runs several projects to support *catadores*, ranging from improving the infrastructure of cooperatives with the Pimp my Cooperativa project to the circuit for self-employed *catadores* (Pimp my Carroça n. d.). The circuit values *catadores*' work by improving their carts, and it also values them, offering them medical care and personal assistance. It also makes it easier to connect buyers to *catadores*, increasing *catadores*' income and providing payment for the services provided, as users of the Cataki app pay a fee for the service. Finally, the initiative has developed prototypes to make the carts more ergonomic and efficient, contributing to *catadores*' physical health and reducing environmental impact by using electricity instead of fossil fuels ([Table 8.1](#)).

Grassroots Initiatives as a Critique of the Social Order

Waste Pickers' Struggle for Climate Justice

Climate justice entails acknowledgment that climate change can have different social, economic, environmental, and public health impacts on underprivileged populations. It begins with the recognition that certain groups and individuals are differently affected by climate change. Thus, there could be significant differences between rich and poor, women and men, and older and younger in terms of the consequences for their lives. The UN Secretary-General António Guterres emphasized this, saying, 'as is always the case, the poor and vulnerable are the first to suffer and the worst hit'

Table 8.1 Examples of grassroots initiatives for waste pickers in Brazil

Organization	Description of actions
National Association of <i>Catadores</i> (Associação Nacional de <i>Catadores</i> e <i>Catadoras</i> de Materiais Recicláveis—ANCAT)	<p>ANCAT is a nonprofit association formed by and for <i>catadores</i>, linked to the National Movement of <i>Catadores</i>, focusing on issues such as packaging recovery, reverse logistics, and technology, as well as on generating and organizing data on the sector:</p> <ul style="list-style-type: none"> • <u>Recycle for Brazil</u> <p>The program aims to regularize, improve, and professionalize the work of recycling cooperatives and associations. With cooperatives from 269 cities participating, it is considered the largest inclusive recycling program in the country.</p> <ul style="list-style-type: none"> • <u>Citizenship hub (Hub da cidadania)</u> <p>A partnership between ANCAT and the private sector (Heineken Institute) in 2023, this project seeks to identify needs, and offers individualized care, relying on a multidisciplinary team (psychologists, social workers, lawyers, and others).</p> <ul style="list-style-type: none"> • <u>Brazilian Recycling Atlas</u> <p>This document provides a secure and traceable database with information portraying the entire recycling chain across different types of materials (ANCAT s.d.).</p>
Pimp My Carroça	<ul style="list-style-type: none"> • <u>Pimp my Carroça Circuit</u> <p>This NGO creates public events and provides interventions and repair for carts used to collect recyclables, as well as paintings by renowned graffiti artists in parallel with a wide range of social services (Pimp my Carroça s.d.).</p> <ul style="list-style-type: none"> • <u>Cataki app</u> <p>A nonprofit collaborative platform aiming to connect citizens and companies that seek to properly dispose of their recyclable materials to independent <i>catadores</i>.</p> <ul style="list-style-type: none"> • <u>Carts of the future</u> <p>In 2021, the first electric cart model was launched in the city of São Paulo.</p>

Source: Authors' data.

(United Nations Secretary-General 2019). Furthermore, the impacts of climate change are exacerbating already existing inequitable social conditions. Thus, low-income communities, people of colour, indigenous people, people with disabilities, older or very young people, and women in general are more at risk and will suffer more. Living in underserved neighbourhoods with precarious infrastructure makes people more vulnerable and more prone to risks. In many cities in the Global South, this encompasses most of the population. Hence, climate change can be seen as a problem of justice. Critical reflections and different framings have emerged in the literature on climate justice, for example, questioning how the benefits and burdens of mitigation and adaptation to climate change should be distributed and split within cities and among cities, considering huge discrepancies in resources, socioeconomic capacity, and political voice (Chu and Michael 2018).

Climatic factors directly affect the livelihoods and living conditions of waste pickers and exacerbate their vulnerabilities. The root causes of such vulnerability are linked to socioeconomic conditions and the exercise and distribution of power across society (Blaikie, Cannon, Davis, and Wisner 2014). Waste pickers are exposed to social stigma, exploitive work relations, and dependency, and they experience social and economic exclusion on a daily basis. The nature of their work exposes them to extreme climate episodes (heat, cold, rain, and wind), and they are more likely to suffer from heatstroke, dehydration, headaches, fatigue, or heat rashes (Michael, Deshpande and Zervogel 2019). After heavy rains and flooding, waste pickers are directly exposed to contaminated water, which can transmit diseases such as leptospirosis, disseminated by the urine of infected rodents. Heavy rainfall can also damage their storage facilities, drenching their materials and leading to significant income losses. As a result of climate change impacts and injustice, the livelihoods of population of waste pickers, already a financially and socially distressed one, becomes further affected.

Waste Pickers in a Just Urban Transition

A just transition must be fair and equitable, accounting for race, ethnicity, class, and gender, especially for the Global South (McCauley and Heffron 2018). However, it can be difficult to build a just transition due to the historical colonial relations established among the countries of the Global North and Global South. Transition is inevitable, but it also is a conscious process, meaning that it may not be just, and may rather reinforce capitalism, intensifying social inequalities and maintain the colonial transition model

(Svampa 2023). It is therefore crucial for any agents of a just transition to reflect on the development model and the type of society desired and to promote change in our current consumption and production model (Svampa 2023).

Justice at urban scales requires a recognition of existing forms of inequality, rights, and responsibilities and an understanding of how climate change interventions can exacerbate or redress underlying structural issues (Ziervogel et al. 2017). Thus, a just urban transition seeks to constitute just cities, which do not have any disproportionate burden falling on vulnerable groups, whether it be risks, dangers, harms, or benefits to a particular group. The urban dynamics involve multiple actors and powers, with political, institutional, social, and economic forces and counterforces (Hughes and Hoffmann 2020). Thus, just urban transition is not only concerned with redressing past injustices but also with addressing structural inequalities as cities seek a low-carbon future (Hughes and Hoffmann 2020). Waste is a major urban problem globally. This is why recycling has gained prominence in society seeking a just transition, as it supports the reduction of exploitation of natural resources, reduces environmental pollution, extends the useful life of products, and generates work and income. In the Global South, especially in Latin America and Africa, recycling only becomes possible as a result of the work of waste pickers. As noted, however, most waste pickers do not enjoy fair working and living conditions.

Waste picker leaders are initiating and sustaining discussion of the sector with respect to a just transition. An example of this is the participation of waste pickers in debates surrounding the Global Treaty against plastic pollution. This treaty is intended to significantly reduce the pollution caused by disposable and unnecessary plastic items and is the first attempt to address plastic pollution from extraction to disposal in a legally binding way. Waste pickers recognize that their work contributes to reductions in plastic pollution and carbon emissions, and they are not opposed to technological advances in waste management or to banning of plastic materials, but they call for this process to be done with workers in mind while updating forms of work for better livelihood opportunities (Arora 2022).

Transformative solutions to climate change cannot be achieved if the understanding of the problem is not transformed as well (Jasanoff 2018). For this reason, considering strategies combining environmental solutions with adequate labour supply is an important turning point (McCauley and Heffron 2018). Waste pickers recognize their vulnerability to climate change, and they are calling for a just transition to take place for workers throughout the plastic chain. This transition requires social innovation geared towards

waste pickers. Some waste pickers have already developed and implemented significant social innovations, which must be recognized (Zapata Campos et al. 2023). Taking the context of vulnerability in which most waste pickers live into account, better working conditions can also mean better living conditions. Vallin and Gonçalves-Dias (2019) showed that some women *catadores* in Brazil may prefer this work to domestic work, given the exploitative relationship that is often part of the daily life of domestic workers. Other women *catadores* may prefer to work in a cooperative instead of taking a better-paid, registered job that requires a long commute due to the proximity and thus better quality of life that a cooperative can offer (Vallin and Gonçalves-Dias 2019). However, we should not romanticize the work of waste picking, while not ignoring the fact that waste picking can represent economic opportunity for some.

Figure 8.3 shows waste pickers in their unacknowledged role as social innovators fighting injustice. Capitalist and neoliberal social structures force people into vulnerable situations and make them accept work as waste pickers. Waste pickers often belong to marginalized and vulnerable social groups based on race, gender, class, age, migration, and other factors. While working, they are exposed to many dangers and risks. However, collecting recyclables is an opportunity for workers who can discover the socioenvironmental contribution that their work makes to society. Even where they do not obtain fair financial returns, their self-perception through the contributions made by their work encourages resilience. In this sense, they challenge the system to remain in it. From this interpretation, we can see the struggle that waste pickers undergo in search of better working and living conditions. Their goals are manifold, and they vary from fighting waste incineration to struggling to get paid for the environmental and cleaning services they provide. Regardless of their particular orientation, the mobilization of waste pickers contributes to the struggle for environmental justice and climate justice and for the construction of a just urban transition, whether by recovering materials and channelling these resources into recycling and the circular economy or by creating low-barrier job opportunities to help create cleaner cities (Gutberlet et al. 2020, Gutberlet 2023). They perform environmental education, contributing to raising awareness concerning the impacts of our excessively wasteful society (e.g., many *catadores* visit schools and community centers to speak about waste management). They question the need for materials that are not recyclable or that do not yet have a market, providing potentially valuable insight to product and material design, developing a transition toward less waste. Most *catadores* see plastics as yet another material to be recovered and placed on the market and do not

necessarily support a complete shift away from plastics towards less problematic and more recyclable materials. While the *catadores* movement is involved in plastic treaty discussions, leaders' voices are often not radical enough in their demand for a paradigm shift away from petroleum-based materials.

Innovations in the field of solid waste management are continually being discussed, and innovations in relation to the circular economy are gaining prominence. The mainstream definition of the circular economy mentions three major outcomes: reduction in the use of virgin raw materials, reuse of already processed materials, and recycling of materials considered waste (Kirchherr, Reike, and Hekkert 2017). While it is argued that it will have great benefits, the circular economy is technocentric, led by companies and policies that prioritize economic growth rather than addressing wider social and environmental issues (Corvellec, Stowell, and Johansson 2022). Furthermore, the circular economy generally does not focus on the social facets involved in recycling, and the concept overlooks waste pickers and waste workers as key protagonists (Burneo, Cansino, and Yñiguez 2020). The next figure presents the many vulnerabilities waste pickers suffer from and the opportunities they identify and engage with representing a spiral towards a just urban transition (see Figure 8.3).

Grassroots initiatives accumulate innovative knowledge on waste collection and handling by waste pickers, as they live with materials daily. They therefore have the potential to contribute to the creation of a circular economy, as they recognize the difficulties involved in recycling different types of materials that often become waste. Waste pickers are thus key to developing strategies aimed at minimizing resource losses and optimizing circularity and recycling. They critique the present waste management system and the circular economy, as they are not recognized as main actors. They are also vocal in criticizing the implementation of waste incineration in many countries. In Brazil, for example, a national movement of *catadores* has halted the implementation of the waste to energy industry in several municipalities. Participatory structures, such as seminars, conferences, and meetings organized by the national movement of *catadores* or by their allies have strengthened their movement and struggle, producing victories as well as backlash. Continuous engagement and dialogue have been instrumental for moving the agenda forward.

Nevertheless, local governments and industries rarely engage in dialogue with waste pickers or recognize their knowledge in developing their programmes. This lack of communication and partnership has created an impasse, as waste pickers require resources to maintain and optimize their



Figures 8.3 Waste pickers grassroots social innovations to a just urban transition

activities, and without adequate support, there are limits to what they can achieve.

The social and solidarity economy (SSE) seeks to promote change in social and economic systems based on human rights, democracy, solidarity, inclusion, diversity, and self-management. It is concerned with livelihoods, working conditions, and forms of noncapitalist and hierarchical organization (Singer 2006; Castelao Caruana and Srnec 2013; Laville 2015). The social and

solidarity economy supports the development of public policy that would encourage grassroots and community-based initiatives. Solidarity economic enterprises (SEE) are collectively and democratically managed, including recovery companies, associations, cooperatives, and networks. In Brazil, the social and solidarity economy encourages social innovation, such as solidarity selective waste collection, a project to strengthen the participation of *catadores* in selective waste collection. Brazil's federal solidarity selective collection project requires public institutions to separate their recyclable waste and send it to recycling cooperatives. In spite of the encouragement given to social issues, the SEE perspective is not widely enough applied. The *catadores* movement has learned from such alternative economies that question the existing order of capitalism and envision alternative developments. The social and solidarity economy is tolerated by the government and the business sector in Brazil, and it operates as a niche within the capitalist system, but it has serious limitations. While ideas of equality, justice, and sustainability permeate the discourse of *catadores*, the change desired is limited, given that the capitalist system offers them short-term benefits, silencing their critique and preventing more widespread radical actions. The absence of a solidarity economy in political proposals and the initiatives of large companies precisely demonstrate the difficulties that exist in aligning other forms of operation that could contest capitalist logic. In this sense, taking on social innovation proposals based on the social and solidarity economy could be important for strengthening a just urban transition, but it needs to occupy wider spaces.

Globally, *catadores* and waste pickers, along with other grassroots social movements that are pursuing another logic of development (leading from social and environmental values to demanding a sustainable and just transition), are facing limitations, particularly resource limitations. However, their examples, driven by a vision of a better world and implemented in everyday practice, transmit hope to alter the current social and environmental order. These cases illustrate the crucial roles that *catadores* can play. In their innovative practices, they challenge the injustices of the current social and environmental order, both in waste management and in citizenship and environmental issues, developing a new critical epistemology of waste.

Final Considerations

Many challenges continue to face waste pickers and community-based social initiatives and must be granted greater empowerment if climate justice and

a just transition are to be achieved. The revolutionary aspect of the work of waste pickers in particular is tied to the fact that innovations in social development target those in society who have been historically marginalized, stigmatized, and without a place at the negotiating table or in decision making. Resisting and overcoming obstacles and questioning power dynamics and manoeuvring past all sorts of imbalances are part of the everyday praxis of waste pickers in their daily struggle and in their innovation.

In the current environmental crisis, waste pickers have always been on the margin, exposed to environmental injustices. Over the years, through their power of agency, waste pickers have organized themselves on the international, national, and local fronts, becoming protagonists in environmental discussion involving waste and recycling.

Waste pickers' and their allies' practical actions, described above, are crucial for advancing waste pickers as socioenvironmental service providers, allowing for climate change mitigation and improved environmental quality. By means of these and other innovations, they contribute to finding solutions that can help increase material separation at the source, improve rates of recycling, and developing creative ways to add value to materials previously discarded as waste. They also engage in many ways with environmental education, helping raise awareness concerning the connections between consumption and waste. Their participation in the elaboration of the global plastic treaty, for example, has been a significant technical and practical contribution. It is a necessity to include these protagonists in debates regarding climate justice.

These social movements and networks are constantly struggling to increase their recognition and inclusion. Their marginal voices and their initiatives need to be seen and heard to enable their contributions to be noticed and their vulnerabilities addressed.

Finally, waste picker leaders are seeking recognition to enable a more radical climate justice in cities, recognizing the roles they play in diminishing greenhouse gas emissions and reducing the city's footprint. The effective critical practice of waste pickers addresses several of the United Nations Sustainable Development Goals. They contribute to recovering citizenship, and they perform urban environmental services that contribute to climate change mitigation. Their leaders understand the root causes of their inequality and their struggle for these to be addressed in public policy, with outcomes that can improve social, environmental, and climate justice. They challenge authorities to address the sharing and distribution of the benefits and disadvantages of adaptation actions across the city in a fair way, recognizing that communities experience varying levels of adaptive capacity,

socioeconomic status, and political voice. Waste picker leaders are contributing to the dialogue needed for policy innovation, technology improvement, and widespread social innovation.

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A Critique of Heroic Efficacy

Hervé Corvellec

Introduction: The Return of Waste as a Resource

The idea of regarding waste as a valuable resource is not a novel one. Throughout history, the retrieval and utilization of discarded materials, particularly human excretions, have played a significant role in the organization of production and resource management (Laporte 2000). ‘Any Rags, Any Bones’ (Strasser 1999, 69) that were not utilized or reserved for future purposes by their original owners were gathered and exchanged to serve as inputs for subsequent production processes.

During the second half of the twentieth century, the perspective of waste as a valuable resource was momentarily overshadowed by the pressing concerns of waste pollution mitigation and the management of newfound disposability (Strasser 1999). For some decades, emphasis was placed on waste collection and disposal, so that waste would not stand in the way of economic growth. The resource potential of waste (O’Neill 2019) resurfaced rapidly, however. The question “‘Solid Wastes’—A Resource?” (Havlicek et al. 1969) received an affirmative response with the advent of waste disposal technologies capable of balancing costs and revenues (e.g., Wilson and Wilson 1978).

The perspective of waste as a resource gained increasing traction in the field of waste management during the 1990s (e.g., Stessel 1996; Tammemagi 1999), supported by the widespread adoption of the waste hierarchy as a guiding model for waste governance (Lansink 2018). The Swedish Waste Management Association, for instance, emphasizes the importance of viewing waste as a resource and treating it accordingly (Avfall Sverige 2023). Veolia, a global French company with the corporate motto, ‘Resourcing the world,’ asserts that household waste is a resource capable of producing green energy (Veolia 2023). And the European Union, which once considered waste management as a means of preserving natural resources (1975/442/EEC), shifted its legislation ‘to avoid waste generation and to use waste as a resource’ (2008/98/EC (28)).

This chapter draws on French philosopher François Jullien's (2004) critique of efficacy to propose a critical examination of the perspective that regards waste as a resource. Trained in antique Greek and Chinese philosophies, Jullien proceeded via detours through the thinking of ancient China, Confucianism, and the literary and aesthetic conceptions of classical China, to question the history and categories of European philosophy. He argued that the Western understanding of efficacy is characterized by a departure from an abstract plan, following a means–ends rationale, focusing on intended outcomes and envisioning an ideal and desirable future. But that understanding is a situated understanding of what constitutes a resource and how resources should be utilized, rooted in a belief in the ability of deliberate planning and control. This ability is personified in the figure of the hero, whose ambiguities embody Jullien's critique of efficacy. Heroes are celebrated for their remarkable ability to mobilize resources and achieve extraordinary feats; yet they can also be revered for making absurd sacrifices leading to severe defeats, even to the extent of surrendering their own lives. In contrast to Western philosophy, Jullien (2004) drew attention to ancient Chinese philosophy, proposing an alternative understanding of action as an accompanying immersion in the course of events rather than a forward-looking expression of will. He (2011) suggested an embracing of the immanent nature of transitions through a perceptive awareness of the dynamic of modifications and continuations.

The view of waste as a resource is taken here to be a manifestation of an efficacious mode of thought, with all its underlying assumptions, contradictions, and limitations. The claim that waste is a resource is questioned for being a quintessential assertion of the heroic efficacy of human beings in inventing social processes that turn things into resources (cf. Hultman et al. 2021). In the wake of this view, a series of inversions occur, turning failures into opportunities and problematic signs of the past into promises of future prosperity.

In the tradition of unregulated disposal of human and animal waste, landfilling, recycling, or promises of waste prevention, to consider waste as a resource is an effort to neutralize the negativity of waste by organizing its disappearance (Corvellec 2019). In a reordering of the relationship between economy and the environment (Hultman and Corvellec 2012), waste, discards, garbage, and pollution cease to be disturbances and threats and become attractive means of serving human ends. To claim the ability to move from waste to resources is to claim that there is no defect, no rejection, no residue of human activities—merely opportunities for greater efficacy; that even what is used, perhaps broken, and certainly devalued and rejected,

worthless to the point that one may pay to dispose of it, can be the starting point of a process of valuation and valorization (Vatin 2013), ending with the claim that a resource has been created and is an expression of an unwavering faith in the entrepreneurial ingenuity of humanity to be efficacious. If even waste can be a resource, there is no limit to human efficacy.

Yet, as Jullien has stressed, efficacy is elusive. The Anthropocene, also called Wasteocene (Armiero 2021), is an illustration of the limits of efficacy: Not all solutions are profitable, not all problems have solutions, efficacious solutions in one context may have deleterious effects elsewhere, and the unintended consequences of economic and technological efficacy are significant and often irreversible. The Anthropocene, as an unintended yet fundamental outcome of humanity's pursuit of efficacy, encapsulates the limitations of heroic solutionism as efficacious mode of thinking.

Theory: Contrasted Ways to Understand Efficacy

Jullien's detours through ancient Chinese philosophy allowed him to present a decentred intelligibility of such concepts as alterity, efficacy, immanence, landscapes, and transformations. These detours rest on a working hypothesis that ancient Chinese thought is the 'Greek's absolute *other*' and thus that a 'knowledge of the inside of Chinese is equivalent to a deconstruction from without, from the exterior, of Greek thought and speech' (Ricoeur 2022, 256). Jullien has been accused of idealizing Chinese philosophy, feeding the myth of its alterity, disconnecting it from the closed and oppressive imperial system that it served, and being oblivious of other and dissonant voices (Billeter 2006). Yet, his detours have the efficacy of the crab (Lyotard 2022): an oblique march that highlights that which jams the European conceptions of things.

The *Treatise on Efficacy* (2004) is a case in point. In this elucidation of his philosophical approach, Jullien invited the reader to examine the European tradition and how it stems from the 'primitive mentality' exhibited in Platonism. In it he conceives of efficacy 'on the basis of abstract, ideal forms, set up as models to be projected onto the world and that our will deliberately establishes as a goal to be attained'; that is, 'a tradition of means and ends, or of the interrelation between theory and practice' (Jullien 2004, vii). Modern expressions of this antique understanding of efficacy are found in instrumental rationality—*Zweckrationalität*, or rational choice theory—even if Jullien preferred to illustrate his reasoning with Clausewitz rather than Kant or Weber.

In contrast, in ancient China:

[W]e discover a concept of efficacy that teaches one to learn how to allow an effect to come about: not to aim for it (directly) but to implicate it (as a consequence), in other words, not to seek it, but simply to welcome it—to allow it to result. (Jullien 2004, vii)

Jullien's detour through ancient Chinese thought exposes the limits and assumptions of Western philosophy. His view of efficacy as a philosophical concept was derived from a worldview in Greek philosophy in which one first constructs an ideal form (*eidōs*) which one takes to be a goal (*telos*) and then acts in such a way as to render it factual. From this ideal-goal-will mode of reasoning he derived a recurring mode of action:

[A] revolutionary designs the model of the city that must be built; a soldier sets out the plan of war to be followed; an economist decides on the growth curve to target; and, all of them, whatever their respective roles, operate in a similar way. Each projects upon the world an ideal plan that will then have to be incorporated into factual reality. (Jullien 2004, 3)

Jullien wanted his readers to see efficacy as a measure of the capacity to employ resources in such a way that they would go from concrete means to an end that was ideally conceived. Prudence, cunning intelligence, and agility of the mind are recommended because, on closer examination, this move raises many difficulties. As means interacts with other means, for instance, their specific efficacy is dissolved, transformed, and becomes immeasurable. Likewise, one cannot help but wonder if anyone engaged in all the complexity of situations that are still in the process of evolving is ever in a position to 'choose' means that are sufficiently clear and distinct—means whose future effects are possible to foresee in order to compare them and 'deliberate' upon them (Jullien 2004, 38).

Moreover, the purposeful and probationary nature of means is liable to collapse at every moment when it meets practice. Yet the means-end provides a framework for many actions. Jullien focused on military strategy and diplomacy; I would add management.

Ancient Chinese thought approaches efficacy in a radically different way. To begin:

It regards the whole of reality as a regulated and continuous process that stems purely from the interaction of the factors in play (which are at once opposed and complementary: the famous *yin* and *yang*). Order is not perceived as coming from

a model that one can fix one's eyes on and apply to things. Instead, it is entirely contained within the course of reality, which it directs in an immanent fashion, ensuring its viability. (Jullien 2004, 15)

Rather than aligning action with an ideal end, ancient Chinese thought invites one to concentrate attention on the course of things in which one finds oneself in order to identify the potential inherent in the situation and to make the most of its consequences. The Chinese way is that 'efficacy is the capacity, inherent in the process of reality, that allows the myriad things to transform themselves endlessly, and without assertive human action, as the situation dictates' (Shankman 2006, 183). This view calls into question the humanist concept of efficacy:

For what counts is no longer so much what we ourselves personally invest in the situation, which imposes itself on the world thanks to our efforts, but rather the objective conditioning that results from the situation: that is what I must exploit and count on, for it is enough, on its own, to determine success. (Jullien 2004, 17)

The apparatus of efficacy of will, ends, plans, means, and outcomes gives way to an efficacy defined as an ability to accede to a logic of unfolding and being carried by the inherent potential of the situation as it evolves. As Lyotard explains:

It is obvious to the Chinese that a situation has a propensity, that we are enveloped in it, and that it is unspooling its results. A situation consists of that unspooling. And all possible effects are due to that immanent effectuation: causeless effect, willed or not, a moment rather of permanent effectivity. (Lyotard 2022, 3)

In a near-caricatural way, Jullien described two opposed conceptions of the efficacy of action: a direct one in which the means lead to an end, and an indirect one in which the conditions lead to the consequences. In citing Mencius, Jullien wrote: 'Though your hoe be in hand, it is best to wait for the proper season' (2004, 16), and Lyotard added:

Plants grow; rain falls; things take their course. You would be efficacious to follow that course and its rhythm before it becomes overly determined, before the moment of ripeness. (...). Efficacy begins when we embrace the situation in its most open potential state. Do not wait for your enemy to barricade himself in before launching your assault. Attack his rear before he has finished forming up. Nothing is more contrary to efficacy than a siege or a pitched battle. (Lyotard 2022, 3)

Relating the direct means–ends form of efficacy to the European literary tradition of the epic, Jullien stressed that the means-end rationale of action entails risk-taking—to grab the right opportunity—one that requires the audacity to surpass oneself. He recommended that one should investigate the immanence of transition rather than searching the essence of things.

Audacity allows heroism to emerge as a key figure of efficacy. Heroism tries to modify the course of things rather than follow them and attempts to constrain or force effects beyond what could reasonably be expected. It sets ends irrespective of the actual conditions, following plans devised in advance, even when they have lost their relevance, and celebrates difficulties even disproportionate to the difficulty of the task. Heroism also exalts individuals and human glory—possibly over and above the pure function of efficacy—providing the substance of heroic stories and prompting jubilation for the subject. The European path of efficacy celebrates heroism, possibly even more than it celebrates strategy. Chinese strategy, on the other hand, is wary of heroic actions: ‘Chinese strategy is not concerned with glory and is wary of heroism. Or rather, strategy is, in principle, nonheroic; it must not be heroic’ (Jullien 2004, 81).

Jullien articulated doubts about the long-term effects of Western efficacy, unable as it is to grasp the dynamic of modification and continuation that characterizes transformations: ‘[I]t is not efficacious to intervene forcibly in any situation. To do so may constitute heroic—or at any rate spectacular—action, but it is pointless. It will come to naught’ (2004, 96).

He illustrates this point by contrasting the Chinese figure of Yu the Great with the Greek figure of Heracles (hereafter Hercules, after his better-known Latin name) made famous for his dangerous and costly labours. The Chinese legend focuses on the time when the waters covered the earth and people no longer knew where to turn. To address this issue, the Great Yu made use of the lie of the land, which sloped down towards the sea and let the water flow easily. Hercules would probably have evacuated the water by digging some majestic waterway: two different modes of action, with Yu relying on propensity rather than searching for a confrontation.¹

¹ Commenting on an earlier version of this chapter, Olli Pyyhtinen (personal communication) noted that, despite their differences, these two legends have in common that they propose solutions to a crisis in individualistic terms (an individual comes up with a solution) rather than as a collective affair requiring joint action in and through relationships. If so, the modes of action they present are more similar than different.

Cases: Three Approaches of Waste as a Resource

An empirical exploration of the shift towards viewing waste as a global resource frontier (O'Neill 2019) identified three approaches which are particularly operational at viewing waste as a resource: the waste hierarchy, the lean movement, and the circular economy. The focus is on the type of waste that Reno (2018) calls utilitarian waste, after Hanna Arendt: waste that derives from the common world of things.

The Waste Hierarchy: Extracting Value from Waste

The waste hierarchy, also known as Lansink's ladder, named after the politician who introduced it in the Dutch parliament in 1979 (Lansink 2018), has been the guiding model for waste management in the European Union since the Waste Framework Directive (2008/98/EC).

The waste hierarchy establishes a standard differentiation among options for waste management: prevention, preparation for reuse, recycling, other forms of recovery, and disposal. Prevention refers to measures taken before a substance, material, or product becomes waste. Preparing for reuse involves such activities as checking, cleaning, and repairing products or their components to facilitate their reuse without any additional processing. Recycling encompasses operations that reprocess waste materials into new products, materials, or substances. Recovery involves operations that utilize waste to serve a useful purpose as replacements for other materials—generating energy or producing compost, for instance. Finally, disposal refers to such operations as landfills, biodegradation on land, deep injections, or release into water bodies. They are all different versions of the waste hierarchy, but they share the same focus on a methodical transformation of waste into a resource. This is a normative order of priority, with prevention being the highest priority and disposal being the lowest. It encourages member states to move up the waste hierarchy to maximize the extraction of value from waste while delivering the best overall environmental outcome for waste management.

The effectiveness of the waste hierarchy as a model for waste governance has been subjected to cross-examination. Its contribution to dematerialization and decoupling is uncertain because it focuses on waste and neither addresses material inputs directly nor considers economic output (Van Ewijk and Stegemann 2016). Its reliance on end-of-pipe solutions limits

its potential contribution to sustainable development (Price and Joseph 2000). Theoretically, the waste hierarchy articulates an ecomodernist framing of waste (Levidow and Raman 2019) that simultaneously emphasizes the non-separability of society from nature while advocating a circulation of materials as separate as possible from the environment (Hultman and Corvellec 2012). Politically, it misses the fact that any efforts to turn its generic principles into practices involve place-specific techno-managerial infrastructural nexuses of materials, water, people, rules, and money that back and are backed by local configurations of resource flows and power relationships (Schramm and Thi Thanh Mai 2018). It also misses the reality that much of the value is extracted from waste beyond the Global North via international waste trade and global networks for reuse, recycling, and resource reclamation in lower-income countries (Gregson and Crang 2015).

Despite the criticisms, the waste hierarchy continues to serve as a model of efficacious waste governance. It serves as practical efficacy for Lansink (2018), who designed his ladder to help public authorities find concrete ways of managing waste; as environmental efficacy for the European Waste Framework Directive, which aims at minimizing the negative impacts of waste management on the environment and human health (2008/98/EC); and as resource efficacy, in that the waste hierarchy provides guidance for extracting maximum economic value from waste by returning it to the economy (Hultman and Corvellec 2012). Whether it serves practical, environmental, or economic purposes, the waste hierarchy functions as a model for resourcing waste, with the goal of transitioning from a less desirable state to a more desirable one.

The waste hierarchy tells the narrative of a timely march towards a globally integrated waste management system capable of solving the waste problem (cf., Wilson 2015). Ad Lansink, the originator of the hierarchy, paved the way for this narrative. Echoing Hercules' cleaning of the Augean stables, waste policy-makers and waste managers are the heroes with the responsibility of scrubbing the nuisance of waste. Other minor heroes include successful examples of polyethylene terephthalate (PET) plastic recycling and industrial symbiosis systems like the one in Kalundborg, Denmark, where interconnected industries utilize each other's waste. The waste hierarchy is an ideal of optimal value extraction from waste, emphasizing the status of waste as a resource.

Lean Production: Learning from Waste

Conceived by the Japanese car manufacturer, Toyota, Lean Management (Womack and Jones 1996) is a production system that emphasizes superior plant performance and efficiency. Its five principles are an epitome of efficacious management of wastefulness: value, value stream, flow, pull, and perfection. (1) Specify value from the standpoint of the end customer (2) Identify the value stream, which constitutes all the activities required to design, order, and provide a specific product or service, from concept to delivery. An activity that does not contribute to delivering value to customers is considered waste. Waste activities that are necessary should be reduced as much as possible, and waste activities that are unnecessary should be eliminated. (3) Create flow by eliminating waste—a progressive achievement of tasks along the value stream aimed at ensuring seamless movement of products, without interruptions, scrap, or backflows. (4) Establish a pull system, in which production and delivery instructions flow from downstream to upstream based on the signals of customers' demands. (5) Pursue perfection, defined as the elimination of wastefulness—*muda* in Japanese—so that all activities along the value stream create value for the customer. These five steps are not organized linearly but form a continuous improvement cycle, with perfection feeding back into value. 'Lean—cut to the core—is about creating a culture for continuously improving the operations of a business or organization' (Netland and Powell 2017, 472).

Irrespective of the context in which it is implemented, lean thinking represents an ongoing pursuit of efficacy in delivering value that departs from a systematic focus on waste. Seven main types of waste are identified within leanness: transport (i.e., excess movement of product), inventory (i.e., stocks of goods and raw materials), motion (i.e., excess movement of machine or people), waiting, overproduction, over-processing, and defects. Each type of waste presents an opportunity to eliminate waste and create value for customers. 'The essence of lean—as it applies to all functional areas of the enterprise and different industries and sectors—is continuous improvement, with learning at its core' (Netland and Powell 2017, 471). For the lean thinking, waste is therefore as much a resource for valuable learning as it is a sign of condemnable inefficacy.

The narrative of lean thinking holds a dual view of waste as a problem and a resource. However, it remains centred as a narrative on a disciplined and perpetual pursuit of achieving an ideal state of waste-free perfection. Inspired in

their struggle by the legendary Kiichiro Toyoda and Eiji Toyoda, who developed Henry Ford's principles of production into the Toyota Way (Womack et al. 1990), lean adepts remind one of Hercules fighting Hydra. Lean managers are heroes struggling with the seven types of *muda* that regenerate themselves, not unlike Hydra's seven heads growing back after being severed. Their fight against the Hydra of waste is never-ending. Each iteration of the five lean thinking principles serves to identify new activities that can be classified as *muda* and require attention. Waste-free processes are a resource like long-term vision for continuous improvement rather than an immediate or achievable objective.

The Circular Economy: Enterprising Waste

The circular economy represents a third approach to viewing waste as a resource. Originally a concept in environmental economics, its proponents envision an economy in which waste generated during resource extraction, production, and consumption is redirected back into the production process rather than being sent into the environment (Pearce and Turner 1990). First in China and later in the European Union and other countries, over the past twenty years, the circular economy has become a guiding principle for industrial and environmental policies. Its scope has expanded to encompass various activities aimed at maximizing material and energy efficiency, delivering functionality rather than ownership, proactively engaging stakeholders, and delivering systemic changes (Fehrer and Wieland 2021).

There are many definitions of the circular economy, but if you ask those working with it, it is:

an economic system that targets zero waste and pollution throughout materials lifecycles, from environment extraction to industrial transformation, and to final consumers, applying to all involved ecosystems. Upon its lifetime end, materials return to either an industrial process or, in case of a treated organic residual, safely back to the environment as in a natural regenerating cycle. (Nobre and Tavares 2021)

One central definitional trait is a movement away from the linear economy and the development of closed resource loops (Figge et al. 2023). Another is to maintain value and reduce waste to zero (Kirchherr et al. 2023). Zero waste necessitates the prevention of waste, as in lean production, and the

integration of the waste (that nonetheless exists) back into the economy, as in the waste hierarchy.

The resourcification of waste is a key element of circularity. Examples include a tile manufacturer incorporating inert materials obtained from urban waste incineration to produce high-end urban flooring (Fedele and Formisano 2023); a waste management company preparing re-use items once considered waste and returning them to the economy (Moalem et al. 2022); and recycling in the townships of Cape Town positioned as an opportunity to unlock jobs for people in poverty (Perez 2021). Advancements in circular developments rest on creative ways of imagining a structural adaptation of the capitalist economy to the double problem of waste accumulation and resource scarcity (Savini 2019). Circular transformations of waste into a value proposition rest on a paradox, however, as they may increase the demand for waste (Greer et al. 2021). Circular practices can also trigger a rebound effect that increases rather than decreases material uses (Greer et al. 2021). Again, failure lurks behind success.

The narrative of the circular economy revolves around an ideal of perfect material loops, free of waste. The circular mythology is personified by Ellen MacArthur's exploit of circumnavigation sailing, which, through the advocacy of her foundation, has become emblematic of the circular economy. It is also personified by Yvon Chouinard and Patagonia clothing company's steadfast commitment to cradle-to-cradle principles. Heroes of the circular economy are the entrepreneurs who invent innovative ways to develop circular products, business models, and ecosystems able to combine the prevention of waste with its exploitation as a resource, thus enabling economic growth within the limits of the planet's boundaries. Linearity is their adversary; waste is an opportunity for entrepreneurial pursuits (cf., the European Circular Economy Action Plan: COM/2020/98 final). Drawing again on mythological imagery, if the waste hierarchy evokes Hercules' cleaning of Augeas stables and lean production is reminiscent of his fight with the Hydra, the circular economy reminds one of his capture of Cerberus, the three-headed dog that guards the gates of the Underworld—the name given to the world of waste by American novelist Don DeLillo (1998).

From Efficacy to Heroic Efficacy

The waste hierarchy, lean production, and the circular economy have in common that they go beyond waste as a practical problem that should be addressed under conditions of respect for public health and the environment.

They do not stop at the conventional view that '[w]aste is what we do not want or what we fail to use' (Gourlay 1992, 21), but engage with waste to develop a waste regime (Gille 2007), where it is a source of wealth. Refusing to see waste as an endpoint of inefficacy, these three paragons of efficacy engage in a heroic battle against uncontrolled waste management, *muda*, and linearity to demonstrate that the frontier of efficacy can be pushed to the point where waste becomes a resource.

The waste hierarchy, lean production, and the circular economy share another commonality: their striving for policy and managerial efficacy follows the rationale of heroic efficacy identified by Jullien. And all three depart from an ideal: optimizing the extraction of value from waste, learning perfection from waste, and building perfect circles. They construct corresponding narratives of integrated waste management, waste-free processes, and closed material loops. The heroes of these narratives are waste managers, adepts of lean, and circular entrepreneurs. Real-world examples of PET recycling, Kiiricho and Eiji Toyota, and the Patagonia company are sources of inspiration, whereas practices of informal waste management, *muda*, and linearity act as foils. The Waste Framework Directive (2008/98/EC), Toyota way, and hyped circular business models are their plans. (See Table 9.1.)

Their heroism lies in their commitment to making waste disappear, despite the practical impossibility of that task. Their heroism lies in a larger-than-human commitment to an impossibility that echoes Hercules' epic labours. Turning waste into a resource is the high route of efficacy. The waste hierarchy, lean production, and the circular economy position themselves as dedicated to walk this route for the common good, pursuing ideals that transcend ordinary waste management efficacy. Their heroism is grounded in their commitment to resourcify even waste—arguably the farthest one can come from a resource.

Discussion: Critique of Heroic Efficacy

The waste hierarchy, lean production, and the circular economy envision a Zero Waste World with no spills, leftovers, rejects, or discards. Aiming at the disappearance of waste, they envision 100 per cent resource efficacy: a world without waste. The strategic vision of *Avfall Sverige*, a trade organization of Swedish municipal waste management firms, asserts, for instance, that 'There is no waste' (2022) to communicate that all waste should be considered a resource.

Table 9.1 Examples of approaches of waste as a resource

Approach of waste as a resource	Ideal	Narrative	Heroes	Worldly heroes	Adversaries	Plans	Corresponding Labour of Hercules
The waste hierarchy	Optimal extraction of value from waste	Towards a global integrated waste management	Waste policy makers Waste managers	Ad Lansink PET recycling Kalundborg	Informal waste management	Waste Framework Directive (2008/98/EC)	Augias stables
Lean production	Learning from waste to develop waste-free processes	Endless quest for waste-free perfection	Lean adepts	Kiichiro Toyoda Eiji Toyoda	Muda	The Toyota Way	Hydra
The circular economy	Enterprising circularity	Creating endless material loops	Circular entrepreneurs	Ellen MacArthur Yvon Chouinard/ Patagonia, Inc.	Linearity	European Circular Economy Action Plan (COM/2020/98 final) Circular Business Models	Cerberus

Viewing waste as a resource is a paradigmatic expression of an efficacious mode of thought. It is an example of solutionism (Morozov 2013)—an ideology that recasts complex social phenomena as problems awaiting technical solutions. Disembedding waste from the social rationales of wasting (Liboiron and Lepawsky 2022), it is a reductionist approach that presents waste as mere economic and technological end-of pipe challenges. Green entrepreneurs, enlightened consumers, and circular-economic policymakers are heroes of zero-waste sociotechnical solutions for today's and tomorrow's waste problems.

If waste is a resource, then waste is under control. Nature does not need to serve as a sink for the dirt of a system created by humans (Gabrys 2009). The economy no longer poses a threat to the environment, the relationships between the two being rearranged in a non-conflictual way (Hultman and Corvellec 2012). A *Zero Waste Home* (Johnson 2013) is within the reach of us all. The global waste crisis is therefore efficaciously averted.

Waste-as-a-resource is a happy-ending fiction that glorifies the heroic capacity of humans to solve even the thorniest problems. Opposite the tradition that views waste as idleness and failure (Scanlan 2005), the waste hierarchy, lean production, and the circular economy strive to mine waste for value. Artificial floating coastlines to collect plastic litter at sea, industrial procedures to reduce *muda*, or innovative circular business models all exemplify the expectation that technical developments can turn waste into an asset. Waste is colonized by the so-called extractivist paradigm (Sörlin 2022).

If even waste can be turned into a resource, then virtually anything can be resourcified (Hultman et al. 2021). There is no limitation to the human capacity to invent valorizing processes (Vatin 2013) that serve what humans anthropocentrically define as their needs. The creation of value out of non-value that underlies the move from waste to resource epitomizes human prowess at creating value. Rather than being indicative of failure of design and imagination (Gourlay 1992), waste becomes the ground for future growth and progress. As wasting becomes a resource-generating activity, capitalism once again demonstrates its capacity to prosper from everything, even its contradictions (Mohammed 2021).

But despite all Herculean efforts, waste is by no means under control. The crisis of waste (Hird 2022) is deep and systemic, comprising much more than household waste or plastic litter at sea. Wasting practices add to a civilizational order. Earth has entered the Wasteocene (Armiero 2021)—an age of global socio-ecological crisis caused by pervasive toxic-wasting practices. Waste is no longer an Other from which humans can distance themselves,

with the help of adequate techniques. As portrayed by Italian novelist Italo [Calvino \(1974\)](#) in his short story, *Leonia*, waste is all around the city, ready to engulf waste producers in their own garbage. The idea of maintaining immaculate cleanliness within the realm of consumption by constantly dispensing waste is a fallacy. Waste leaks ([Olofsson 2025](#)). Given that emissions alter the climate and plastic waste infiltrates soil, water, and organisms, waste overflows its management, making it impossible for humans to separate themselves from their waste. Waste is not outside humans; it is part of them ([Liboiron and Lepawsky 2022](#)). The Anthropocene is the Apotheosis of waste ([Yaeger 2008](#); [Hecht 2018](#)) that allowed waste to become a mark of historical time ([Riebeling 2022](#)). Efforts at fully controlling and neutralizing waste are as pathetic as they are delusive.

Claiming that waste is a resource denies the increasing and cumulative impact of human activities on the surrounding environment. The waste hierarchy, lean production, and the circular economy deflect the reality that waste is here to stay in landfills, in waterways, and in the atmosphere. The promises that the waste hierarchy will clean the Augeas stables, that a lean production floor will master the Hydra of *muda*, and that the circular economy will control the underworld of waste by capturing the Cerberus are all promises of heroic efficacy. Yet, these promises negate the failure to keep waste production within the boundaries of Planet Earth, as per [Steffen et al.'s \(2015\)](#) concept. Claiming that waste can be a resource detracts from the innate wastefulness of the economic system highlighted by [Packard \(1960\)](#) decades ago. Waste-as-a-resource denies the fact that waste is already an omnipresent anthropogenic hazard to life on Earth. Inversions occur when failures are turned into opportunities and unkind remnants of the past are transformed into promises of prosperity. If a resource, the fact that waste 'implies the mis- or overuse of natural resources, their diversion from the fulfilment of basic human needs in huge swaths of the globe' ([Gille 2022](#), 16–17) is neutralized.

By assuming success, heroic efficacy enables the evasion of responsibility for eventual failures. For instance, the plastic-bottle industry can avoid being held accountable for introducing products onto the market that are 'Made to be wasted' ([Hawkins 2013](#), 1). Individuals and industries are absolved from any responsibility or guilt for their normalizing ([Svingstedt et al. 2020](#)) of wastefulness. Rather, the burden of responsibility is shifted onto those who do not contribute enough to the liberation of forces of resourcification—typically bureaucratic public authorities and unwilling customers.

The issue with heroic efficacy is not that it is a form of efficacy. There is nothing wrong with a waste management that neutralizes the risks that waste represents for public health and promotes recycling. It is that heroic efficacy

does not have the modesty of acknowledging human limitations. It is also impervious to other ways of imagining action.

Heroism places its hopes in larger-than-human individualistic solutions rather than down-to-earth critical rethinking of the current state of affairs. It is inherently conservative in that it is based on unconditional acceptance and support of the social order. While waiting for heroic solutions, necessary social changes are postponed *sine die*. In that sense, heroism is an anti-critique that deflects the need for social critique and even undermines the legitimacy of critique. Waste heroism promises to make waste disappear, thereby contributing to the normalization of waste, just like the promise of heroic victories contributes to the normalization of armed struggle. Heroes such as the waste hierarchy, lean production, and the circular economy make it possible to elude questions about the rationale of an anthropocentric exploitation of human and natural resources for the benefit of the most affluent. Critiques of resource depletion, pollution, or unequal sharing of wealth are buried by prospects of Herculean performances.

There is a need to invent non-heroic forms of efficacy for the Anthropocene. Some such non-heroic forms are explored in this volume in the context of waste: acknowledging the unruliness of waste (Olofsson 2025; Pyyhtinen et al. 2025), viewing waste as a common and collective responsibility (Zapata and Zapata Campos 2025), and drawing inspiration from marginalized waste reclaimers in the Global South for social and political innovations (Gutberlet and de Carvalho Vallin 2025; Samson 2025).

More generally, a non-heroic efficacy for the Anthropocene would be humbler. It would reject the separation of the social and material realms and acknowledge that the material has become socialized, even as the social is as materialized as ever (Simonetti 2019). It would resist solutionism, for example, by embracing fictional, absurd, and unworkable concepts as tools for critical reflection on which problems are worth solving, why they are worth solving, and how (Blythe et al. 2016). It would not embark on a resourcification of everything but would support other, selective ways of turning things into resources through degrowth-oriented ventures, for example (Corvellec and Paulsson 2023; Hird and Dee 2025). It would also listen to marginalized voices, remain receptive to artistic and non-mechanical worldviews, and maintain a sense of responsibility towards non-human entities and future generations. As a guiding principle, it would depart from embedding action in immanence (Jullien 2004) to question achievements, success, and progress, preparing humans for a massive failure of their current

way of living. In essence, this alternative efficacy would recognize its own situatedness, limitations, pretexts, and contradictions, and be an antidote to the dangers associated with the very heroic efficacy that has propelled us into the Anthropocene.

Conclusion: Time to Retire Hercules

Efficacy is a notion that enjoys such an aura of positivity that it escapes criticism. As for efficacy, the question of how to reach it has overshadowed the question of why one should strive for efficaciousness or the question of the social and environmental impacts of efficacy. But then François Jullien demonstrated in his *Treatise on Efficacy* (2004) that efficacy as it is understood in Western countries is a situated vision of action stemming from the Greek philosophical tradition of abstractions, ideal ends, models, pre-planned action, and Herculean heroism. And when efficacy appears as situated rather than universal, it is also open for questioning and other options.

Drawing on Jullien's critical reflection on efficacy, this chapter has demonstrated that the widespread call to view waste as a resource—with the waste hierarchy, lean production, and the circular economy as proxies—voices a heroic vision of human efficacy with the hallmark that everything could be resourcified. Even waste. Except that the Anthropocene and its accompanying threats, from global warming to the sixth extinction, demonstrates daily the practical limits of such heroism. Heroic efficacy is a conservative posture of alleged control (with a readiness to sacrifice oneself) that deflects legitimate critique and delays necessary social changes. The existential threats to life of the Anthropocene highlight the urgent need to question efficacy, especially heroic efficacy, not the least in environmental management and policy. And they highlight the search for options, humbleness, for instance. It is time to retire Hercules.

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PART III

ECONOMY

Waste as a Critique of the Concept of the Economy

Zsuzsa Gille

Introduction

All analyses of the world's diverse waste problems and the policies aimed at rectifying them operate with at least an implicit assumption about what the economy is and what economic institutions and rationalities are to be blamed and need to change. This is true both for 'purely' technological fixes, such as replacing traditionally powered vehicles with electric ones, and for simulated market devices, such as environmental fines or carbon trading. While the ideological underpinnings or economic paradigms that inform these measures differ significantly, they all accept and apply the concept of externalities. Externalities are costs of production that are not covered by either buyer or seller, for example, the expense of cleaning up a river polluted by some economic activity. For decades, this concept has animated environmental policy instruments, by suggesting that if only environmental and waste expenses were incorporated into the price of goods, or the profit incentives of manufacturers, then targeted economic actors would curb their harmful effects on nature out of sheer self-interest. To be sure, this approach has not been exclusive to Western capitalism. As analyses of, and policy recommendations for, centrally planned economies show, reformers embraced it equally (Gille 1997).

One key assumption is that the economy is a sphere of value generation, whether the value is measured in use value or exchange value (or, as I have previously argued, in favour value¹ (Gille 1997)). Despite the many exciting advances in the social scientific and feminist thinking about the economy–society relationship in the last three decades, what we mean by

¹ In conditions of chronic shortage, economic actors must constantly barter things and exchange favours. Therefore the 'real' value of a good is not determined by the market (which is largely absent in state socialism), nor by the state even though it fixes the official price of everything, but by what that product or service can be traded for.

the economy has not changed, and we have not even thought it necessary to pose the question what definition of the economy we implicitly operate with. We still refer to the economy as a sphere of activity and livelihood, of forms of production, of distribution, and of consumption in which resources are transformed into something of value or positive utility. Different schools of economics may disagree on how value begets value, but they all agree that that is what we investigate when we claim to study the economy. The idea that value also begets waste, and, even more consequentially, that waste begets waste, has been anathema to economics and economic sociology.² Yet, even the most efficient manufacturing process produces by-products and emissions that are not the intended results of the production. In the processing of sugar, molasses result, burning wood generates more than heat, it produces ash and smoke, and tailoring a dress will inevitably leave some textile scraps. As I showed (Gille 2007) liberal (classical) economics either ignores such waste products or accounts for them in ways that go against the first law of thermodynamics, namely that materials cannot appear out of nothing. The recently emerged field, the sociology of valuation (Lamont 2012; Zuckerman 2012), which subjects accounting models, tools of price determination, and businesses that forecast economic trends to sociological scrutiny, is unlikely to transcend this status quo unless it engages more centrally with social practices assessing potential loss, opportunity costs, or other negative utilities, as has been done by STS scholar Geoffrey Bowker (2003) and economic sociologist Marion Fourcade (2011).

In my early work, at the beginning of the 2000s, I asked how we would have to reformulate our social science conceptual toolkit, including our concept of the economy, if, instead of departing from and ending at value and positive utility, we took seriously the basic fact of material life that without waste we cannot produce value; that waste is not epiphenomenal, not an inconvenient, unintended consequence, but rather an engendering capacity in its own right. What new histories would we have to write? How would our social institutions need to be reorganized? What new ethics would emerge? At that time a common reaction by scholars to my research interest was: ‘Why study waste? Why not study people?’ I no longer expect to be asked this question; after all, there is now an established body of scholarship that goes under the name Waste Studies. Today, academic journals not only welcome critical and theoretically informed articles on waste issues—whether in the humanities or

² So as not to prejudge the social construction of waste (the famous maxim that ‘waste is in the eye of the beholder’), I always operate with the metaconcept of waste as material we have failed to use (for whatever reason).

the social sciences—but have dedicated special issues to the matter. The new open-source scholarly journal *Worldwide Waste* is now four-years old.

Yet in a sense there is more to be done now than 25 years ago. There are a number of different reasons for this. First, at that time it was sufficient to point to a general negligence of the subject of waste in the humanities and the social sciences, often invoking Mary Douglas's (1988) definition of dirt as matter out of place, and ending with the conclusion that discarded materials and disposable people intersect. While this new attention to waste was politically important and intellectually satisfying, it excused the eventual and inevitable return to rehearsed topics of social inequality, development, and social movements for which waste only served as the proverbial 'lens'. Second, a serious imbalance exists between the scholarly attention given to consumer waste, as opposed to industrial and other production waste, and its share in the world's overall waste volume.³ Third, and finally, today we need to account not for the absence but for the proliferation of waste discourses and practices.

What are these discourses? Many scholars, progressive activists, and environmental organizations have placed great faith in ideas and projects that appear under the labels 'Zero Waste' (ZW) and the 'Circular Economy' (CE). While there is no agreed-upon definition, let alone policy-ready operationalization, of the terms zero waste or circular economy, what they both aim at is increasing environmental sustainability by preventing the squandering of materials. The idea is to increase the efficiency of material use and keep polluting compounds out of our soil, air, and water, and thereby protecting nature, both as a tap and as a sink. Zero Waste is best thought of as a goal for companies, municipalities, or larger geographical and social units. Most often this is meant to be achieved by diverting already-produced wastes from landfills and by recovering and reusing discarded materials, and to a lesser extent by redesigning products. The Circular Economy idea, in contrast, is best understood as a complex, system-level model for ensuring that all materials are recirculated. If in what follows it seems that I use these terms interchangeably that is because actual circular economy projects involve implementing zero-waste practices. These, in turn, are most commonly operationalized as sending no waste to landfills. Such schemes rely heavily on consumer activism, voluntary corporate standards and certificate schemes with the expectation that they would ring in a new economy that prioritizes waste prevention or reuse over waste treatment, such as the highly polluting technologies of landfilling and incineration. In a way, many

³ In 2020 in the EU-27, household wastes—another proxy for consumer wastes—were 9.4 per cent (Eurostat 2022). Nor can this out-sized focus on individual consumers be explained by the higher toxicity of municipal and household waste streams (Liboiron 2014; Gille 2015; Lepawsky 2018).

of these endeavors aim to bring waste into the realm of traditional economic theories and management practices, so that waste can be prevented or minimized a priori rather than just dealing with them after the fact. They appear to be practical applications of what economic sociologist Michel Callon calls economization. Economizing waste doesn't just mean turning unneeded or already-discarded materials into valuable resources (see Hervé Corvellec, 2025), but endeavouring to render waste in economic terms, that is, translating wastes into recognizable management categories, so they can be anticipated and minimized, if not eliminated altogether, while still not hurting the so-called economic bottom line.

Indeed, Callon's theoretical framework mounts an influential critique of economics because it provides a conceptual toolkit for attending to values, problems, and materials that economists and management practices traditionally ignore, such as human rights violations, or environmental pollution. Callon's rootedness in Actor Network Theory (ANT) that has done the most to incorporate nonhuman entities in social science inquiries also bodes well for making waste materials visible. As such, it appears to be an answer to my call for a new concept of the economy. In what follows, therefore, I will test this hypothesis by applying Callon's economization framework to existing ZW and CE projects, because they can arguably be seen as social experiments of economizing waste. [Callon \(2009\)](#) in his study of the creation of carbon markets argues that negotiations around policy instruments aimed at curbing greenhouse gases, most notably the IPCC, can be seen as real-life laboratories for economizing carbon.

The Economization Framework

Callon's aim with his economization theory is two-fold. First, as elaborated in his co-authored book *Acting in an Uncertain World: An Essay on Technical Democracy* ([Callon et al. 2011](#)), he aims to make science more democratic. He builds on Actor Network Theory (ANT) that demonstrated how nonhumans, such as microbes, laboratory equipment, or soil, are always actively present in seemingly purely human or social action, albeit in an unrecognized fashion. Transcending mere description, Callon suggests that we acknowledge all actors written out of accounts of scientific discovery, and consciously and strategically incorporate them in our decision-making. His concept of hybrid forums first elaborated in this book includes not only nonhumans, such as the human immunodeficiency virus (HIV), but also

the AIDS activists, who successfully fought for treatment and participated in developing and testing medications. He suggests that by consciously constructing such hybrid forums, we can prevent the unintended consequences that plague the history of science and technology, such as the pollution and negative health effects of many technological innovations. Because in his mind these result from the limited expertise and experience of the scientists and manufacturers in charge of technological innovation, other perspectives and other knowledges need to be added to the ‘actor network’ so such negative outcomes can be better anticipated and ideally prevented.

Extending this ANT perspective to economics, Callon demonstrates how different actors are entangled in actions and transactions that constitute the economy. Rather than starting from the assumption of an always-already existing social field called the economy, he suggests that the economy is made. To be sure this goes beyond the performative school’s claim that economists make the economy (MacKenzie et al. 2007), because he attends to material action by actual economic actors, not simply to the conceptual arsenal of economists. This is in service of his second goal. He hopes that by making visible the processes previously seen as the exclusive realm of economists, we can find points of entry for people and things that are usually reduced to willing participants or passive victims of economic actions.

I will now introduce the key concepts of this economization framework and will provide empirical examples from ZW and CE projects to better understand them and to answer whether Callon’s theory is better equipped at nudging our concept of an economy towards a waste-centred view and to test his contention that conscious and well-executed economization is simultaneously democratization. According to Callon, economization consists in ‘processes through which behaviours, organizations, institutions and, more generally, objects are constituted as being “economic”’ (Çalışkan and Callon 2010, 2). This in turn is accomplished by a series of entanglements, disentanglements, framings, and qualifications—in general, socio-material *agencements* that make it possible for economic actors to function, for products to become goods, and for market actors to ‘find’ each other. The French word ‘*agencement*’ is preferred to the English equivalent ‘arrangement’ because it suggests that an arrangement or a particular network of actors, human or nonhuman, invariably endows those actors with new capacities, ‘agentializes’ them, if you will, and stunts certain others. This is why, and it is in this sense that, English-language texts applying ANT and some poststructuralist frameworks use the French word. In the context of contemporary capitalism, economization is almost always marketization—that is, rendering objects not just economic but marketable. This involves at least

five tasks: 1. Pacifying goods; 2. Marketizing agencies; 3. Market encounters; 4. Price-setting; 5. Market design and maintenance.

Acts of *agencement* aim at creating a frame for the assembly and qualification of goods; however, as Koray ÇalıŖkan and Michel Callon repeatedly assert, frames are neither impervious nor stable, so that framing must be repeated. This is because humans, things, actions, goods, and mechanisms tend to overflow the frames initially created for them. Overflows are more than the term known from economics as externalities because, as ÇalıŖkan and Callon (2009) show, this time in agreement with adherents of ‘new economic sociology’, there are many things that escape the temporarily stabilized framing of a product. Overflows can be material effects, costs, or qualifications. Callon’s team primarily focuses on what goes into the negotiations and calculations that determine not just the price but also the very ontological nature of the commodity in question.

Overflows is seemingly a good theoretical framework to turn to when writing about waste. After all, overflow implies excess, and usually of unwanted stuff. This is indeed why two volumes have taken up Callon.⁴ I have a different reason for turning to Callon. His extension of Actor Network Theory to economics may appear as a radical redefinition of the economy that can now finally take into consideration overflows, including waste. I will apply Callon’s economization framework to ZW and CE projects for two reasons. First, it would help test whether participation in ‘framing’ negotiations is effective, not for the successful functioning of the market (which is Callon’s concern), but for placing the economy on a more environmentally sustainable footing by economizing waste. Second, I will respond to the question of whether talking about *economization*, rather than the economy (as an always already given) guarantees that we can render visible processes of waste generation (not just value-to-waste and waste-to-value, but also waste-to-waste vectors).

The Economization of Waste

How do ZW and CE projects accomplish the economization of waste? The task of pacifying goods in CE and ZW projects entails turning them from wild unknowns to things with fixed qualities (qualification). Here

⁴ Volumes edited by Barbara Czarniawska and Orvar Löfgren (2012, 2013) extended the use of the overflow concepts considerably and have made many intriguing applications. A few of these studies focused on waste specifically; some more narrowly (Åkesson 2012; Corvellec 2013), and others more broadly, as in overconsumption (Brembeck 2012; Péteri 2012). Neither of these however place the overflow concept in Callon’s larger oeuvre, which, as I will show aims at democratizing science and the economy.

Nicky Gregson et al.'s (2015) example of how the physicality of anaerobic digestion–derived digestate prevents it from being usable as bio-fertilizer is indicative. To wit, it must comply with four main regulatory norms concerning pathogens, potential toxic elements, stability (volatile fatty acids and residual biogas potential), and contaminants. Furthermore, qualification is not only about the chemical composition of the digestate; it is also about the need to render the previously used dry pellets of fertilizers physically and functionally in a form that make it 'look like' fertilizer. Others raise the concerns about waste fuel not meeting certain, even basic, safety concerns, such as when bales of organic material explode (Reno 2011; Alexander and Reno 2014). To demonstrate a different task of qualification, Corvellec and Herman Stål's (2019) analysis of 'circular fashion' shows that the 'trials' of circular apparel go beyond technical or economic calibration, and, perhaps most importantly, incorporate a communicative task, in which consumers themselves have to be 'qualified' (cf. Hawkins et al. 2015).

A different way of achieving ZW objectives is buying utility but not the product that provides it. This is especially useful when a ZW commodity is too expensive, and/or its maintenance, cleaning, and repair require specialized expertise. Many Cradle-to-Cradle–certified companies lease a good or an infrastructural system, which they keep in good working order for a certain number of years, and then disassemble and discard in a safe manner, preferably with an 'upcycling' effect. Examples of this principle's application include providing energy-efficient workplace lighting, office furniture, carpets, and interior walls. This way it is no longer the consumer who is burdened with dealing with the waste resulting either from low quality or from the product reaching its end of life, but rather, the manufacturer or 'seller' is financially motivated to produce environmentally safe and high-quality goods. In these cases, qualification involves the additional task of disentangling utility from the good. Qualification is an ongoing project. In what Çalışkan and Callon call the successive qualifications of a good, the utility bought is subject to an iterative negotiation between seller and buyer. In our above case of leasing office furniture, for example, the partners would have to agree how long an office chair is considered 'utilizable': until it breaks completely, or until it creaks and wobbles, but still holds the weight of an employee, swivels, and is otherwise in mechanical order? What 'functionality' means might have to be re-evaluated as the 'buyers' needs change.

Marketizing agencies—that is, activating participating entities in processes of valuation—is the next task, and involves developing their capacities to 'calculate the relative values of the goods.' For CE projects this necessitates new

devices of quantification that render the pacified goods (such as digestates) in recognizable financial terms, and thus allow them to be subject to traditional cost-benefit and other market analysis. These devices then are mobilized in the fourth task, that of price-setting, that I am leaving to the end of this list.

Market encounters do not emerge naturally, but rather they require encountering devices, for example intermediaries between producer and consumer. In CE projects, these would be clearing houses where available wastes are recorded and categorized, that could take the form of websites, advertisements, and even certain civil groups.

To understand how price-setting is achieved, Çalıřkan and Callon suggest the term ‘valorimeters’ for ‘the various tools, procedures, machines, instruments or, more generally, devices effecting this controversial translation of values into figures and, more precisely, into monetary amounts’ (2010, 17). This, as they emphasize, involves comparison with other products. This in CE involves other raw materials and by-products. For example, different classes of plastic recyclates, or by-products with different levels of purity fetch different prices on the market, and, furthermore, their prices fluctuate with the market, making marketizing agencies an ongoing task. For projects in which the commodity is the service of providing a utility for a certain time, as in the example of leasing office furniture, comparison is with what one would spend on buying, repairing, discarding, and rebuying the actual commodity.

Finally, market design and maintenance involve not just marketized agencies but also non-market actors to ensure that various legislated policies are not violated, such as laws of commerce (anti-trust, tax rebates, etc.) and environment regulations. In sum, a functioning CE or a ZW enterprise requires the same tools of economization and marketization as regular economic activities.

Devices

To simplify and to make more useable this framework for my purposes, that is, for demonstrating the devices necessary for the economization of waste, I suggest that we focus on three types of devices, which in my coinage are those of (il)legibility/quantification; those of qualification; and those of incentivizing.

To render waste economic, first, it has to be made visible and calculable, and thus accessible for regular economic practice. Second, it has to be qualified so it can be recognized as a useful material resource for a new product, a source of energy, or a complete product as it is (as detailed above). Third, economic actors have to be incentivized to change their usual behaviour and

enroll them in realizing the circular economy. (These tasks do not necessarily emerge in this order, nor do they occur only once; rather there is an ongoing process whereby these build on each other and generate each other in an unpredictable sequence.) These involve three types of devices: those of legibility, those of qualification, and those of incentivizing. I have detailed the tasks of qualification in the previous section. Devices of legibility and quantification include, but go beyond, price-setting; they include some elements of market design and maintenance, but overall, they primarily aim at opening up a product or an economic unit's performance to calculative evaluation. Most commonly, these are indicators of efficiency, material or energy intensity, rate of return, etc. Callon's team is not concerned with these devices because they figure less centrally in direct market encounters, which is what he sees as the main site of economization. Nevertheless, they become important for management and economic governance.

Devices of incentivizing are also missing from Callon's framework, even from his own case of carbon markets, because he reduces failures of enrolling actors in carbon markets to overflows—that is, an inattention to some actors' concerns. Indeed, in order for economic actors to develop marketized agencies they have to be incentivized. Actors will not enroll in carbon markets without an obligation by the state or pressure from the citizenry and consumers. Actors adopting CE or ZW principles to their operation often tout the slogan 'beyond compliance', meaning that they do not just observe existing regulatory standards but exceed those norms. Going beyond the government-dictated norms suggests that the state is not necessary for ensuring environmental sustainability, and as many, including [Corvellec and Stål \(2019\)](#), argue, it is meant to preempt further regulation and ensure that business operations are not interfered with. Devices of incentivizing are especially important in CE projects, as there is little in the regular linear-economy ethos and how it is embodied in calculative practices that 'naturally' steers economic actors towards environmental sustainability. An example of incentivizing devices would be setting the price of using municipal landfills at a higher level than the cost of reducing and reusing waste.

Let me then turn to these devices in CE projects. As Joan Marc Simon, the coordinator of the Zero Waste Europe network claims, 'you have to see what it is, otherwise you don't know how to deal with it', meaning that if you don't know what kind of waste and how much you generate, you won't know how to start eliminating it ([Simon 2012](#)). Devices of legibility already mobilized include visual props—such as deterrent images of landfills, plastic floating in the ocean, and denuded forests, but also the encouraging images of hygienic-looking glimmering high-tech waste-to-energy facilities (incinerators). Most of the legibility devices, however, are in the realm of

statistics, and refer to various social scales and units, such as product-specific indices about recycled content, savings of corporations achieved by reusing and recycling, and national-level indices about material and energy efficiencies and intensities. The famous managerial quip that ‘you can’t manage what you don’t measure’, which might only seem a more particular version of Simon’s above claim, is frequently quoted in writings about CE indicators. Measuring is certainly a way of seeing things: a very particular way. Let’s see what it makes visible and what invisible.

I want to spend extra time on the various efforts to quantify circularity, because this is where currently the most passionate contestations occur, at least within the EU. But this is also a particular interest of mine, because for the last two decades I have been arguing that the absence of reliable statistical data on wastes is not only a major obstacle to preventative waste policies but also a convenient fact. This doesn’t necessarily mean that quantification was made intentionally impossible, simply that withholding action when there is technical capability is a particular form of power, as John Gaventa (1982) reminds us. It is also important to realize, as I demonstrated in the case of state socialist Hungary, that devices of legibility and quantification facilitate incentivization. In early state socialism, a particularly waste-conscious regime, for example, waste statistics were not only about rendering visible the potential of by-products, scraps, or other materials left unused, but also to measure these against quotas and then use quota fulfilment as a basis for rewarding or punishing economic actors, primarily enterprise managers and workers (Gille 2007).

As has been pointed out by many involved in this endeavour, the problem with quantifying ZW goals and relative success of achieving them is that one has to measure something that is not there. This conundrum didn’t seem to scare off statisticians; today there are at least 320 indicators aimed at measuring resource efficiency and productivity, and CE indicators specifically. The key international actors in this project of quantification are, unsurprisingly, the World Bank, the OECD, various arms of the United Nations, the European Union (EU), and various universities, International Non-Governmental Organizations (INGOs), and think tanks.

The following metrics have received the most attention among devices of legibility and quantification.

1. Diversion rates measure what percentage of wastes (municipal or corporate) has been diverted from landfills. The higher the rate, the more circular the economy of the municipality or corporation is supposed

to be. Diversion techniques include reuse, recycling, incineration, or composting. One problem with this metric is that it cannot interpret source reduction, only what happens to already generated wastes. Another limitation has to do with the underlying assumption that incineration, if it produces energy, is preferable to landfilling. While landfilling may result in more greenhouse gas emissions, it is usually also more toxic than dumping, because it tends to produce new and newly hazardous compounds, such as furans, dioxins, as well as ash that still needs to be buried in the soil.⁵

2. The ZW index is a tool to measure the potentiality of virgin materials use to be offset by ZW management systems, including air and water used in waste management.⁶ The idea here is that substituting for virgin materials is an indication of how much of our wastes we are effectively reusing. The calculation focuses on volumes and leaves invisible the chemical composition and thus the toxicity of the materials involved.
3. Measuring reuse is more straightforward, yet few companies are tracking and reporting such data. In many cases, third parties collect used products, and no information is relayed back to the manufacturer or end user of the product. Questions surrounding the design of such indicators include whether reuse should be measured as a percentage of products reused, as total tonnage of waste prevented through reuse, or by the value of reused products.
4. The Material Circularity Indicator, developed by the [Ellen MacArthur Foundation \(2015\)](#), measures the materials that flow through a particular product, so the savings in virgin materials use and pollution can be estimated for different design versions.
5. Composite indicators is an umbrella term for indices that combine linear indicators of economic performance already in use in a single formula that can convey information about the extent to which a nation's economy is on circular footings. A possible example mentioned by the [European Academies Science Advisory Council \(2016\)](#) is one that combines per capita, per GDP, and per total energy supply measures with recycling rates.

⁵ In the United States, Unilever is offering independent third-party validation and certification for three waste reduction claims: 'zero waste to landfill' (100% waste diversion from landfill), 'virtually zero waste to landfill' (between 98% and 100% waste diversion), and 'landfill waste diversion' (between 80% and 98%) ([Trebilcock 2015](#)).

⁶ It is calculated by multiplying the total amount of waste managed by the system (a city, for example) by the substitution factor (the efficiency of substituting for virgin materials, energy, or water), then dividing it by the total amount of waste generated ([Zaman and Lehmann 2013](#)).

As I demonstrated in this quick and simplified summary, devices of legibility and quantification function as a flashlight in the dark: they reveal some things and leave others hidden. Therefore, by asking about these devices, we also have to ask not only what they make available to our perception and measurement but also what they leave invisible. For example, most newspaper is not biodegradable because of the ink that renders it hazardous waste—so, do you see and measure—the paper or the ink? Similar problems of identifying the target material have been registered with composting, which in the United States is highly contaminated by heavy metals and synthetic chemicals (Ryan and Chaney 2002). With Callon, we could say that some factors and processes overflow the frames established by economists, policymakers, or other actors enrolled in the project of ushering in the CE; I have mentioned some of the ones rendered invisible above. In what follows my critique is focused on how these overflows are negotiated, because Callon's conceptual framework promises that a more democratic and environmentally sustainable economy can be brought about by these trials and experiments.

Politicization or Economization

Even from a cursory overview of the studies aimed at economizing waste—or, more broadly, at translating the project of turning what has been linear into circular—it is evident that there is much debate on what the best devices of legibility and quantification are. What is at stake is not simply which metrics will have the best chance of rendering economic action more easily transformable towards various sustainability goals; this is not simply a technical disagreement about how to make measurement serve management and governance. More importantly, these debates provide an insight into the competition among knowledge producers who hold different, if not contradictory, national, and political allegiances.

When an EU body demonstrates the application of a composite indicator on the example of Germany vs the United States (EASAC 2016a, 25) what is provided is also a judgement about different national governance arrangements. When the same body boasts that most of China's metrics are adopted from EU practice, in contrast to let's say Japan, or when France's report on CE indices (SOeS 2017) finds that France is leading the European countries in the adoption of the European Ecolabel, even as it laments that France's own ecolabel is stricter and broader and better for circularity, what we are witnessing is a not just negotiation, as Callon would have us believe. On the one hand, the tug-of-war that peaks out from between the lines

echoes what is happening in international summits around curbing global climate change, already evident in the early debates around how carbon sinks should be allocated, and thus, who needs to cut back more on emissions (Agrawal and Narain 1991). It also echoes Michael Goldman's (2005) argument that the World Bank—like other supranational organizations, I might add—increasingly focuses on producing knowledge goods. These organizations have established a (formal and informal) right to access economic and environmental information about nation states and their economic actors, which they then combine; feed into equations, algorithms, and models for economic governance (interest rates, currency exchange rates, decarbonization rates, etc.). Finally, they turn them into indices of 'success', mobilized for awarding or denying loans, trade deals, aid, investments, or allowances in international environmental treaties.

Whatever the truth is in the managerial wisdom mentioned above—'you can't manage what you don't measure', its inverse, as Timothy Mitchell (2002) has shown, is certainly in evidence in the economic history of colonialism and neoliberalism. We could summarize this version as 'you measure it, you control it'. What Callon calls negotiation, therefore, masks struggles for control over position in the world polity and the global economy. What is at stake in whose preferred metric will be adopted by the most countries or the most powerful supranational organizations is whose existing economic practices, key environmental and resource concerns will be built into the indicators.

But there is something else going on here. Callon might call the debate around the best devices of legibility and quantification a negotiation of entanglements and disentanglements, which are necessary for any project of economization. Already the development of Ellen MacArthur Foundation's Material Circularity Indicator mentioned above has received financial support from the European Union (through its LIFE Programme⁷), and leading European businesses participated in testing the methodology with their own data. More recently, Ellen MacArthur Foundation created a tool that renders its Circulytics framework legible to EU constituents by comparing it to the EU's new strict sustainability reporting standards (Ellen MacArthur Foundation 2023). Channeling Callon, we could say that Ellen MacArthur Foundation, in its framing of circularity, entangles the European Union's policymaking departments and corporations headquartered in Europe. To be sure, for him and his team such an expansion of the actors participating in qualification is a welcome and, if you will, a democratic

⁷ Created in 1992, the LIFE programme is the EU's financing instrument for environment and climate action.

These allegiances, however, come into play not simply to make the devices of legibility more accurate, nor do the concerns entangled actors bring to these hybrid forums arise from economic and technological rationality alone. As Sheila [Jasanoff \(2012\)](#) warned, we can never assume that only scientific or otherwise rational actors and claims are brought to these negotiations. A study commissioned by the EU and published by the European Academies Science Advisory Council ([EASAC 2016b](#)) suggests several seemingly extraneous criteria for choosing the right CE metrics. Let me review a few of the most relevant ones.

A further issue concerning the relative importance of different materials in CE indicators arises with country-level metrics. A country's energy intensity, for example, depends on its weather conditions and population density (which would affect transportation-related energy use), among other factors. At stake here is obviously what expenditures governments can avoid by simply properly contextualizing and designing an EU-level indicator that will become obligatory for all member states. Furthermore, there is a trade-off between energy use and material reuse or recycling, so that a high score on material circularity may mask environmentally harmful practices. CE indicators, therefore, should be flexible enough to indicate if a technological change outweighs recycling in efficiency, the EASAC suggests. Contributing to the complexity of operationalizing recycling in a CE formula is the location of

⁸ This was the case with the EU's 2000 End-of-Life Vehicles directive, leaving out un-reused or exported-for-recycling high-value strategic materials, such as rare-earth (RE) elements, palladium, and platinum, usually only available from imports. https://environment.ec.europa.eu/topics/waste-and-recycling/end-life-vehicles_en -:~:text=Directive 2000%2F53%2FEU on, set out in Annex II.

recycling. EASAC advises the adoption of indicators that allow extra-EU recycling, since that might be more cost-effective.

Additional problems arise from the fact that these indicators are relative. First, what needs recognition is that the portion of recycled content in a product does not indicate how complete the recycling of a particular commodity has actually been. Second, as these indices measure the use of energy, various materials, or waste volumes in relation to output, unit of product, capita, etc., they misrepresent progress towards environmental sustainability—since in absolute terms environmental burdens may still increase as long as the economic growth rate exceeds the rate with which these efficiencies increase, and material intensities decrease. Third, since some of these indicators can show improvement in cases of an economic downturn, EASAC suggests that they are complemented with others or should be designed in such a way that they factor in CE's contribution to economic growth and competitiveness, as well as employment.

EASAC warns that business interests make further demands of these metrics. Measuring circularity should not add too much burden for business even as they are encouraged to design for disassembly and reuse. Finally, indices should be easily useable for communication with the public. The public is seen as providing a potential political leverage for elected officials to embrace legislation related to CE, but it can only do so if it is made sufficiently aware. Maps and Sankey diagrams are particularly advocated as easy tools of legibility that can also identify opportunities for businesses.

This cursory survey of [EASAC's \(2016b\)](#) concerns clearly demonstrates that the debate around the efficacy and accuracy of indicators is the negotiation of larger policy objectives: what a CE is, what its priorities are, who should pay for it, but also whose socio-material assemblage is upscaled. Devices of legibility and quantification therefore do not just economize, they politicize. They entangle certain actors and not others. Actors concerned with or responsible for trade balance, geopolitical position, government expenditure, industrial secrets, and copyrights find themselves included in the hybrid forums. Labour, however, whether within the EU or outside it, is fully disentangled. Consumers are similarly absent, though presumably their price sensitivity is implied in the concern over the cost of recycling and the value of materials to be circulated. Disentangled are also regions outside the EU, where high-value but not sufficiently recirculated raw materials are mined, and the Global South, where materials are exported for recycling (see [Corvellec et al. 2022](#)). [EASAC's \(2016b\)](#) advice to design indicators that can measure gains in circularity achieved by exporting waste for recycling to

the Global South suggests that the Global South could be ‘entangled’ in the economization of waste, but the question on whose terms and to what extent that is done remains bracketed, a point I will expand on below.

In the example of the creation of carbon markets, Callon talks about a three-fold, simultaneous and dialectic process of economization, scientization, and politicization. As actors entangled in the qualification of carbon—defining it as a good, identifying proper sellers and buyers, setting its price—the economic, the scientific, and the political are also transformed, perhaps to the point of the dissolution of their boundaries. For him, as for ANT in general, these categories of social thought deserve to be retired. They have outlived their utility, if indeed they ever had any;⁹ and, having been too caught up in tired ideological debates about the autonomy of the market, are now in the way of out-of-the-box thinking and creative problem-solving. The Callonesque solution is to open up the economization process to all in a dialogical fashion, so that, just as Habermas (1989) advocated, participants either leave their identity behind or allow for that identity to be transformed.

However, as my analysis of the ‘negotiation’ around the economization of waste—and, more narrowly, the calibration of devices of legibility and quantification—demonstrate, there is no guarantee that all ‘stakeholders’ will indeed have a seat at the table or that they participate with the intention of moving the process along. Where is their information coming from? Where do they find the time and resources to participate? Can we assume that they have a right to participate? Indeed, who decides what the basis of entitlement to participation is or what the criteria for identifying an actor as a stakeholder are? Should, for example, the owner of a Chinese rare earth mineral mine be allowed to veto the EU’s decision to use only recirculated rare earth compounds in new electronics manufacturing? Can China take this grievance to the World Trade Organization, identifying it as an unfair barrier to free trade? Is the power of certain participants to silence other actors recognized and ‘managed’ in this ‘dialogic’ process? Is the proverbial round table indeed the only place where negotiation takes place? Or are there other ‘round tables’ behind closed doors where decisions are made in a way that limits the possible choices debated around the open one? These and possibly dozens more similar questions arise not from the abstract concerns of political philosophy, but from evidence of the real-world operation and record of stakeholder governance,

⁹ See Bruno Latour’s (1993) lament over the separation of natural and social sciences in *We Have Never Been Modern*.

participatory development, and voluntary corporate sustainability standards. In these much-studied political experiments, we see how blunt of an instrument Callon's and ANT's entanglement/disentanglement dichotomy is. This binary conceptual tool cannot recognize that actors are unequal in terms of their capacity to act or even to compel others to listen to them. The question of on whose terms and in what time frame one participates in hybrid forums is also ignored. Instead of entanglement and disentanglement, we must go back to the classical social science vocabulary and see these links as social relationships, and, as such, connections among members of society, organizations, classes, ethnic groups, etc. already positioned differentially in social space and in heterogeneous relations with nonhuman actants. To assume that by the sheer act of deliberation these positionalities and allegiances can be loosened or unmoored altogether is more than naïve; it dangerously questions the relevance of democratic representation.

Callon is right to this extent: new voices need to be allowed into decision-making around waste and sustainability issues. However, the assumption of 'the more the merrier'—which in turn is informed by the belief that our previous problems, whether acts of injustice or negative unintended consequences due to technological adoptions, resulted from a rush to closure—is wrong.¹⁰ Aiming for open-endedness and prioritizing indeterminacy are counterproductive, because they favor the status quo. Just look at how deliberations in the undoubtedly hybrid forums around combating global climate change have gone: in many cases admitted are 'scientists' who claim there is no such thing as global warming, or at least that it's not caused by human activity. Also participating are oil-producing nations and corporations, free-market ideologues who want no government surveillance, let alone restrictions on conducting business and trade.¹¹ Many of them keep arguing that the scientific facts are inconclusive or that the suggested measures and new technologies are not sufficiently 'evidence-based'. Our current problem is not that what is indeterminate is prematurely made determinate, but vice versa: the determinate-enough is made indeterminate and thus un-actionable and un-regulatable, so that no actor is held responsible or compelled to remedy environmental and waste problems.

Are we dealing here with public uncertainty or an uncertain, or should we say uncommitted, public, however inclusive that public may seem? What

¹⁰ Issue closure is tackled at greater length in Callon's interview with Andrew Barry and Dan Slater (Barry and Slater 2002).

¹¹ In his article on carbon markets, Callon conveniently only mentions those constituents in the hybrid forum that are already 'converted' scientific actors, such as those in the IPCC (Callon 2009, 539).

Callon calls for—a hybrid, open-ended forum that deliberates endlessly—is already our lived reality. Discourse around waste and sustainability has proliferated to an unprecedented extent. Economists talk to scientists; corporations negotiate with governments and NGOs; banks finance ZW projects and recycling facilities with favourable conditions; community watch groups discipline residents' use of trash and recycling bins, enforcing the increasingly private collection services' regulations; and disability, homeless, and post-incarceration integration activists are all on board with waste-related job creation. And yet, in most categories waste generation continues to increase, the planet continues to warm, and we are sicker than ever from toxins in our air, water, food, and cells. Callon's framework accurately captures what is happening in circular economy projects, that is in the negotiations around economizing waste, and as such its descriptive power is unquestionable. However, the shortcomings, most notably the lack of progress in sustainability and the hijacking of negotiations by vested interests while zero-waste and circularity metrics proliferate, suggests that as a model it has already failed. It celebrates what is already here: the economization or, more precisely, the marketization of politics. As in the field of waste, in other sustainability matters too what we need is the opposite: to politicize the market. Subordinate its actors to democratic scrutiny, regulate their actions, and hold them accountable.

Conclusion

In closing I want to return to my initial question: has the economization framework helped us leave behind the outdated concept of the economy as a sphere where the only action is value begetting value? To be sure, ÇalıŖkan and Callon made no secret of their objectives in focusing on economization:

Nothing moves on its own. If a good is produced it is because it has a value for its producer; if it is distributed it is because it is a source of value for its distributor; and if it is consumed it is because it has a value in its consumer's eyes. The forces that explain the circulation-transformation of things are the same forces that give things value. In short, things circulate because they are valued and it is because they are valued that they become goods (Dewey 1915). Circulation consists of an essentially dual process involving continuous requalification and valuation. This explains why the materialities of things matter. (ÇalıŖkan and Callon 2009, 389)

While based on this clear statement our scepticism over the capacity of Callon's framework to end the value-centredness in economic thought would have been justified, it had also held out a promise of a different, more relevant, more realistic concept of the economy. The above quote also suggests the possibility of attending to materiality and, with it, to the materiality of waste. There had also been the promise of incorporating previously taboo issues in decision-making by embracing new deliberative actors, who could have and should have included people whose lives (livelihood and well-being) intersect with discarded materials, whether those sickened by toxic leakages from dumps and incinerators or by material contact in the workplace, or those making a living out of scavenging. Or even those who are losing their livelihood because the resources in their environment are used up for inundating an ever-increasing circle of societies with an ever-increasing amount of consumer goods with an ever-shrinking life span. After all, both these groups of humans and these varied forms of wastes could justifiably be considered overflows in market frames. But even if they were or could be, their concerns cannot be reduced to, or indeed be misinterpreted as, a concern with the right market design, as Callon's team suggests.

This could lead to actors hitherto excluded from or considered as external to the world of politics being granted an unusual place and role in the debates but also in decision-making processes. For this to happen, the creation of procedures that we have proposed to call dialogical could be demanded. The idea would be to allow for all the actors concerned by *the design and functioning of a particular market* to be identified and to express themselves, and then for their analyses and proposals to be compared (Çalışkan and Callon 2009, 546—my emphasis).

The Callonesque framework would only focus on attaching the right value to wastes already produced or in the making. It is not simply that this framework still exclusively focuses on value, but that even the dynamized concept of economization focuses on the exchange of values while their production itself is absent. It's as if the public can only concern itself with price-setting, the design and maintenance of markets for already designed and manufactured goods, but not with their generation and manufacturing. This approach to the economy represents a step back and not a step forward in democratizing it nor indeed in placing it on a more environmentally sustainable footing.

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Not at Our Disposal

Reclaimers' Critique of Disposability Capitalism

Melanie Samson

Introduction

Reclaimers who salvage recyclable and reusable materials are often upheld as emblematic of 'disposable people' or 'surplus populations', who are assumed to be superfluous to the contemporary capitalist economy and social and political life (cf. [Davis 2005](#); [Giroux 2008](#); [Li 2010](#); [Sassen 2010](#); [Sanyal 2014](#); [Millar 2018](#)). In perhaps the best-known example, Zygmunt Bauman (the academic most closely associated with the concept of 'human waste') famously asserts that in the modern era, 'the stage is set for the meeting of human rejects with the rejects of consumer feasts; indeed, they seem to have been made for each other' ([Bauman 2004](#), 59). According to Bauman, the situation for reclaimers and other 'disposable people' is utterly hopeless:

They may well be excused for feeling rejected, being incensed and indignant, breathing vengeance and harbouring revenge—though having learned the futility of resistance and surrendered to the verdict of their own inferiority they could hardly find a way to recast all such sentiments into effective action. Whether by an explicit sentence or by an implied though never officially published verdict, they have become superfluous, unnecessary, unneeded and unwanted, and their reactions, off the mark or absent, render the censure a self-fulfilling prophecy. ([Bauman 2004](#), 40)

Bauman is correct in identifying that analysis of the relationship between reclaimers and discarded commodities can provide important sociological insights. However, this is not because reclaimers typify disposability understood as exclusion, superfluity, passivity, and resignation. To the contrary, in this chapter I argue that it is because such analysis enables a profound critique of the ways this framing of disposability facilitates the exploitation of

people who are in fact central, rather than irrelevant, to processes of capital accumulation, and who are powerful political agents who contest, rather than passively accept, their exploitation.

I develop this argument by drawing on South African theorizations of gendered racial capitalism to analyse the complex forms of labour that black reclaimers in Johannesburg, South Africa must undertake in multiple spheres and at multiple scales to perform the seemingly simple task of revaluing commodities that others have disposed as waste. Through doing so, the chapter exposes the patriarchal, white supremacist colonial assumption underpinning capital accumulation (which I argue has intensified in the current period of 'disposability capitalism'), that subjugated people, nature, and commodities can be treated as disposable, understood not as excluded and unnecessary, but as simultaneously disposable and at capitalists' disposal (hence exploitable). The chapter concludes by arguing that the reclaimers' collaborative praxis in the African Reclaimers Organisation (ARO) provides crucial insights into ways to struggle beyond the ideology and practice of disposability and disposability capitalism, as well as challenges in doing so.

Dehumanization and Disposability

Unfortunately, Bauman's derogatory view of reclaimers is commonly held. Like their counterparts elsewhere in the world, reclaimers in South Africa have been stigmatized, criminalized, and treated as less than human (Huysman 1994; Beall 1997; Chikarmane and Narayan 2005; Schenck and Blaauw 2011; Gidwani 2015; Dias 2016). It is widely assumed that reclaimers are uneducated, suffer from mental illness and addiction, perform nothing but manual labour, engage in marginal, survivalist economic activities, and mar the images of cities seeking 'world class status' (Dias 2016). Despite the fact that in South Africa and many other countries in Africa, Asia, and Latin America, it was reclaimers who developed the systems to collect recyclables and divert them into the value chain, now that municipalities have become interested in recycling, they dismiss reclaimers as irrelevant, treat them as disposable, and grant private companies contracts to collect the materials that reclaimers depend on for their livelihoods (Samson 2015; Demaria and Schindler 2016; Inverardi-Ferri 2018).

Reclaimers' presumed disposability and treatment as less than human are bound up with their association with waste and how such associations were racialized as part of the forging of white supremacy during colonization (Millar 2020; Doherty 2022; Solomon 2022). In the contemporary era, this

racialization of waste has become closely articulated with class, as distancing themselves from waste is part of the formation of middle-class and elite African identities in much the same way as Dlamini (2020) argues distancing themselves from nature has been since the colonial era. As a result, it is not uncommon for African government officials and industry representatives in South Africa to engage reclaimers in dehumanizing ways (Samson 2009).

This is painful for reclaimers. As Louis Mahlangu, a reclaimer at the Marie Louise landfill, told me, people treat them 'like you are just nothing. Just like that paper', pointing to a soiled piece of paper mixed with trash. When the reclaimers at his landfill took the municipality and its Pikitup waste management company to court to prevent their eviction, the magistrate's ruling admonished Pikitup for referring to reclaimers as 'scavengers'. Emphasizing how important that was to reclaimers, Mahlangu shared that, 'to be addressed in a... in a human form, ai, it was a very good feeling to have. When they say, no, you can't call a living human being a scavenger... it means you have value in life.'

In addition to having intrinsic value as full human beings, reclaimers create significant economic value and make important environmental contributions by diverting recyclables from landfills. For example, Godfrey et al. (2016) found that in 2015 reclaimers in South Africa collected 80–90 per cent of post-consumer packaging and paper re-inserted into the recycling value chain and saved municipalities up to R748 million (approximately 37 million Euros) in landfill airspace. This makes clear that although reclaimers are treated as disposable human waste, they are in fact the foundation of South Africa's recycling industry. How then is it possible for such a fundamentally incorrect framing of reclaimers to be sustained? To answer this question, I argue it is necessary to understand how gendered racial capitalism was forged and theorized in South Africa, and in particular how this was bound up with the ideologies and practices of racialization, dehumanization, and disposability.

Settler Colonialism, Gendered Racial Capitalism and Disposability

As is increasingly recognized, South African debates on gendered¹ racial capitalism predate the publication of Cedric Robinson's *Black Marxism*

¹ I refer to South African debates on gendered racial capitalism (rather than simply racial capitalism) because although the original contributions to what is referred to as the debate on racial capitalism were blind to both their own gendered assumptions and the ways racial capitalism is gendered, feminist critiques and corrections are as old as the debate itself, and it is time that they be fully integrated so that we

(Robinson 1983) and differ from Robinson's approach in theoretically and politically significant ways. *Black Marxism* draws on political philosophy to develop a general theory of the relationship between racism and capitalism (Hudson 2017, 3). By contrast, the South Africans' analysis was grounded in political economy and deeply connected to anti-apartheid and anti-capitalist struggle. They began their investigations with conjunctural analysis of the establishment of capital accumulation on the gold mines of the Witwatersrand in the context of British imperialism and patriarchal, white supremacist settler colonialism at the dawn of the twentieth century. Because of their focus on praxis, it was crucial for them to understand the specific form of gendered racial capitalism in South Africa to better strategize how to defeat it (cf. Ashman 2022; Levenson and Paret 2022; Clarno and Vally 2023). Although working within political economy, South Africans such as Neville Alexander and Bernard Magubane, and Stuart Hall (who although not South African made critical interventions in the South African debate) conceptualized gendered racial capitalism as simultaneously material, cultural, and ideological (Chari 2022), as well as social, political, and economic (Mabasa 2021). Instead of positing a general relationship between race and class, they argued that it is necessary to employ Marx's method of rising from the abstract to the concrete to understand the particular forms that race and class assume, how they articulate with each other, and the political work that this performs in each spatio-historical conjuncture (Hall 1980; Hart 2007).

One aspect of South African contributions to debates on gendered racial capitalism that has been insufficiently explored is the way that Bernard Magubane² foregrounds the role of a very particular understanding of disposability in the production and reproduction of gendered racial capitalism. Contrary to the understanding of 'disposable people' as superfluous to the economy and society prevalent in influential academic literature, as I elaborate below, Magubane argues that as a result of the intertwined processes of racialization and dehumanization, 'Africans were indispensable and expendable' (Magubane 2007, 212). This formulation is crucially important, as it captures the understanding that although African people were dehumanized in the minds of colonizers and capitalists, they were far from marginal, and the exploitation of their racialized labour was central to capital accumulation. Reframing this in the language of disposability, I argue that the generation of

write and think about South African debates on gendered racial capitalism (cf. Bozzoli 1983; Beall et al. 1989; Hudson 2017; Kenny 2023).

² Magubane was a key contributor to debates on racial capitalism in South Africa since the 1970s. His nuanced contributions have not received the attention they merit in a literature that until recently has foregrounded the work of white scholars (Nyoka 2023).

surplus value was predicated on African people being seen as simultaneously disposable and at capitalists' disposal.

This ideology and practice of disposability by colonizers applied not just to African people, but also to nature, to which they were closely associated through their common denigration in the Cartesian dualism. Colonial conquest was predicated on the assumption that Africans' utilization of the land was wasteful and could therefore be disposed of (Beinart 2000). Colonizers explicitly deployed this assumption of African disposability to justify violent dispossession of Africans to place the land and its resources at their disposal, as per this settler cited by Legassick (2010, 61):

I begin to think that he too, as well as the springbok, must give place, and why not? Is it just that a few thousands of ruthless worthless savages are to sit like a nightmare upon a land that would support millions of civilised men happily? Nay, heaven forbids it.

This process was profoundly gendered. Grounded in the gender ideologies they carried with them, colonizers mapped unknown lands as virginal women, 'empty of desire and void of sexual agency' (McClintock 1995, 30), passively waiting to be "penetrated" ... exploited and tamed by male civilizers' (Mies 1986, 75). As a result, oppressive and exploitative European gender ideology became a core part of how colonized people and their lands were governed. As Emberley (2001) argues in writing about North America, the patriarchal assumption that colonized people were childlike was used to dispose of indigenous governance systems and justify governance through a paternalistic relationship in which colonizers made decisions for the colonized and enforced what they deemed proper behaviour.

The white supremacist ideology and practices that seek to dehumanize African people and treat them as disposable and at colonizers and capitalists' disposal underpin these other presumed disposabilities. In colonial South Africa, the 'sanitation syndrome' (Swanson, 1977) associated African people with dirt and disease, which was then used to justify their segregation and subjection to inhuman treatment and living conditions. As Millar (2020) argues, the association of black people with waste, and the framing of waste as valueless are central to processes of racialization and the forging of a conception of the human ('Man') that in both Sylvia Wynter's and Achille Mbembe's terms necessarily excludes black people. Kesselman (2024) adds that African people's refusal to waste edible parts of slaughtered prey considered unpalatable by Europeans was also cited as justification to cast them

as sub-human ‘savage barbarians’ and seize control of their land to enforce ‘civilized’ methods of agriculture and consumption.

Magubane centres the articulations of presumed disposability, lived brutalities of dehumanizing practices, white supremacy, settler colonialism, and dispossession in the nuanced definition of racism that lies at the heart of his conceptualization of racial capitalism:

the term ‘race’ and its ideology of ‘racism’ should be understood, is shorthand for inhuman social practices, exploitative and oppressive relations that brutalize, degrade and reduce people who are colonized and oppressed to less than human status. It is both a specific term, as in dehumanizing of a whole people, and a global social practice, i.e., elevating Europeans and/or white people into ‘lords of humanity’. It also refers to direct actions, say murder and torture, and structural relations, such as exploitation and oppression of those whose means of subsistence have been forcibly usurped. (Magubane 2001, 4)³

Magubane emphasizes that ‘[r]acism is not simply a discourse, but a practice which produces certain knowledge of the colonized, and indeed, exploited, that makes the practice of domination, restructuring, and having an authority on the colonized natural’ (Magubane 2001, 3). He further argues that ‘inequality of income and wealth is not simply an economic issue but also “implies inequality of life chances”’ (Magubane 1979) in Nyoka (2023, 10) in a formulation that resonates with Mbembe’s (2003) concept of necropolitics and Ruth Wilson Gilmore’s definition of racism as ‘state-sanctioned and/or extra-legal production and exploitation of group-differentiated vulnerability to premature death’ (Gilmore 2007, 28), or one could say, disposability.

The development of the capitalist economy in South Africa, which centred around the discovery of gold on the Rand in 1886, was predicated on the fact that due to prior wars of colonial dispossession, the Rand and the resources beneath it were at the capitalists’ disposal. Yet, there were challenges in mining the gold due to the extreme depths of the deposits. As a result, from the very beginning the gold mines and gendered racial capitalism in South Africa were dependent on British imperial capital (Legassick and Hemson 1976).

However, foreign capital alone was not sufficient to ensure the mining of the Rand’s gold. Magubane captures the centrality of labour by African men dehumanized in the minds of colonizers and treated as disposable to gold mining and South Africa’s political economy, noting that with the imperial

³ Magubane published this 2001 paper under his nickname ‘Ben’ rather than ‘Bernard’.

discovery of diamond and gold deposits, the debate among colonizers regarding whether it would be best to 'exterminate the African' or force 'him' into labour (on the specious grounds that this was civilizing) was settled as 'the new imperialists saw him as a "gold mine"'. Noting that the slang word for gold mining shares at the time was 'Kaffirs', an extremely racist term for Africans, Magubane concludes that 'in a single word the underlying fact is revealed that what was really being exploited in South Africa was not only the gold of the Rand or the diamonds of Kimberley, but the exceptionally cheap labour of Africans, or Kaffirs, conveniently embodied in the gold and diamonds' (Magubane 2007, 210).

Magubane pithily sums up the position of African labour in South Africa's political economy stating that 'Africans were indispensable and expendable' (Magubane 2007, 212). Although he was referring to African men working on the mines, African women's unpaid labour was also indispensable and congealed in the gold and diamonds as, in line with the colonizers' gender ideology, women were confined to rural reserves where they were expected to reproduce their families through subsistence agriculture, thus contributing to the mining houses' profitability by enabling them to pay African men the bare minimum required for their own bodily reproduction (Wolpe 1972; Bozzoli 1983). Desmond's observation that apartheid would be fundamentally threatened 'by the absence from the "white areas" of those blacks whose labour is needed there and by the presence in those areas of blacks who are "superfluous" [in those spaces]' (Desmond 1985, xviii) was therefore equally true in the colonial era. The key was that white capitalists and colonizers treated all Africans as at their disposal, to be deployed and contained as they deemed necessary. Rooted in the white supremacist ideology of African dehumanization and disposability, mining houses further increased profits by housing the men in appalling, inhumane conditions (Legassick and Hemson, 1976) and through gross disregard for their health and safety, which resulted in a mortality rate for African mineworkers of 79.8 per thousand in 1903 (Denoon 1967, 482).

This framing of African people and their labour as simultaneously indispensable and expendable/disposable has much in common with Melissa Wright's conceptualization of the 'myth of the disposable third world woman', which Wright argues plays an important role in capital accumulation the era of globalized production (Wright 2006). Wright argues that capitalist value is generated based on assumptions that third world women are unskilled and so can be underpaid and have their physical and mental abilities wholly consumed in the factories where they work, until they are eventually disposed

as waste. Like Magubane, Wright notes the irony that the 'disposable third world woman is, in fact, quite valuable' as 'the things that she makes generate value even as she depreciates in value' (Wright 2006, 2–3). The fact that Magubane and Wright make such similar arguments regarding the disposability of African people and third world women in two very different spatio-historical conjunctures reveals the common ideology and practices of disposability that underpin the capitalist exploitation of African people (men and women) and third world women, a point to which I return below in my theorization of 'disposability capitalism'.

Contrary to the assumption that so-called disposable people are excluded from and superfluous to capital accumulation, I build from Magubane (and Wright) and the preceding historical analysis of the birth of gendered racial capitalism in South Africa to argue that this simultaneous indispensability and expendability is central to the ideology and practice of disposability and that it is made possible through four key assumptions—1) that African people and their land are at the disposal of capitalists; 2) that their labour has been rendered cheap; 3) that they can be treated as disposable and interchangeable; and 4) that the supply of their labour is inexhaustible—all of which are predicated on violent patriarchal white supremacist colonial dispossession and political, military, and economic control and coercion.

It is, however, crucial to note that the assumption of a readily available disposable African labour force has never been borne out by reality. Despite the profound pressures on African men to work on the mines, many resisted and secured employment in other sectors with higher wages and lower mortality rates. At the beginning of the twentieth century, challenges in securing a local labour force meant that the majority of African mineworkers came from outside South Africa. African mineworkers engaged in strikes and African women, who had resisted their confinement to rural areas and moved to the cities, successfully protested against being forced to carry passes (Denoon 1967; Legassick and Hemson 1976; Magubane 1983; Bozzoli and Nkotsie 1991; Sadler 2002; South African History Online n.d.). Throughout the twentieth century and into the present, although there are ebbs and flows in struggle, African and other black workers and community members have resisted gendered racial capitalism, settler colonialism, and apartheid. This highlights that while colonizers' and capitalists' ideology and practices of disposability may structure people's experiences and struggles, they do not render people dehumanized or disposable, a slippage that occurs far too often in the literature on 'disposable people' (Denning 2010; Millar 2018).

Disposable Commodities and Disposability Capitalism

Starting in the 1950s, capital accumulation came to depend on treating not just subjugated people and nature, but even commodities themselves, as disposable.

Political economists have long identified that as capitalists are driven to minimize and externalize the costs of production, the creation of surplus value necessarily entails the creation of waste (cf. [Baran and Sweezy 1966](#)). In addition to disposed commodities, packaging, and the physical and chemical waste of industrial production, this waste includes the wasting of industrial capacity, natural resources, workers' labour power congealed in wasted commodities that could have been deployed for more socially useful ends, workers themselves as their health and capacity to labour are sucked out of them, and the land, water, and air polluted by industrial production (cf. [Packard 1960](#); [Thompson 1979](#); [Baran and Sweezy 1966](#); [O'Brien 1999](#); [Rogers 2005](#); [Wright 2006](#); [Gidwani and Reddy 2011](#); [Yates 2011](#); [Crang et al. 2013](#); [Goldstein 2013](#); [Liboiron 2021](#)). As Rogers notes, the only waste that capitalists are concerned to reduce is the waste of workers' labour time, so as to extract the greatest possible surplus value and profits from their labour ([Rogers 2005](#), 107–8).

The novel development in the post-World War Two era was a shift to the intentional design of commodities to be wasted and replaced as quickly as possible through 'planned obsolescence', either because they cease to function or become undesirable ([Packard 1960](#)). [Rogers \(2005\)](#) provides an historical materialist analysis of how the rise of planned obsolescence was grounded in the dynamics of capital accumulation and pursuit of surplus value. The development of productive forces and maturation of Fordism during WWII led to tremendous capacity for mass production in the post-war era. Rogers reminds us that Marx argues that '[t]he production of... surplus value based on the increase and development of the productive forces, requires the production of new consumption' (cited in [Rogers, 2005](#), 112), adding that such consumption necessarily entails the generation of new industrial and household waste ([Rogers 2005](#), 112). She emphasizes that the need to constantly increase consumption was clearly articulated by post-war industrialists, citing an influential marketing consultant from that time who declared:

Our enormously productive economy demands that we make consumption our way of life, that we convert the buying and use of goods into rituals, that we seek our spiritual satisfactions, our ego satisfactions, in consumption ... we need things

consumed, burned up, worn out, replaced, and discarded at an ever increasing pace. (cited in [Rogers 2005](#), 114)

With planned obsolescence, the creation of waste became not just an inevitable consequence of capitalist production, but a key focus of capitalist production, as the earliest possible transformation of a commodity into waste was built into its conceptualization and design.

The rising dominance of single-use, disposable commodities was a logical progression of planned obsolescence, as was the transformation of packaging from a utilitarian item into a central component of the advertising required to convince consumers that they ‘needed’ a specific product ([Rogers 2005](#), 115–16). Plastics assumed a special place in the shift to disposable commodities. WWII had focused resources on developing plastics as a wartime material ([Liboiron 2021](#), 2), and the emergence of ‘petro-capitalism’ created not only the abundance of cheap energy that drives the contemporary capitalist economy, but also the plethora of cheap, plastic disposable products that are flooding our landscapes and choking our oceans ([Doherty 2022](#), 207). Switching to production using plastic led to astonishing increases in worker productivity and hence surplus value ([Rogers 2005](#), 118).

However, consumers were not readily inclined to replace items that were still functional or to embrace commodities that deteriorated rapidly. Throughout history, the focus has been on repairing, not wasting. During the Depression, people had become even more accustomed to scarcity and throughout WWII they were encouraged to be thrifty ([Strasser 2000](#)). To ensure that the capitalist gains from disposable commodities were not lost, industry and government invested significant resources and effort in educating consumers on the supposed benefits of disposability, which were argued to include convenience, hygiene, cleanliness, efficiency, and ‘deliverance from domestic drudgery’ ([Rogers 2005](#), 115; [Doherty 2022](#), 8–9). The shift to disposability also depended on material changes, including the discontinuation of alternative products (such as glass bottles) and ensuring that it was cheaper to replace products than to repair them ([Rogers 2005](#), 123).

The advent of disposable commodities necessarily increased the amount of waste. Municipal waste management systems funded by residents (rather than the corporations that created the new excessive amounts of waste) encouraged residents to increase their consumption (hence increasing corporate profits) by regularly distancing them from their waste ([Rogers 2005](#), 117), taking it be landfilled ‘Away’ ([Reno 2016](#)). Comparable services were provided to white South Africans during apartheid.

While disposable commodities highlight the importance of waste disposal mechanisms, cheap disposal has always been crucial for the production of capitalist value, as if capitalists must pay the true environmental costs of burying or burning the waste generated in producing and consuming commodities, many would be rendered unprofitable. Cheap disposal should therefore be added to Patel and Moore's list of seven cheap things—nature, money, work, care, food, energy, and lives—that underpin capital accumulation (Patel and Moore 2018).

Cheap disposal is dependent on two of the other seven cheaps—cheap land and cheap lives. As Liboiron (2021) argues, disposal of the waste and pollution generated by capitalist production is an inherently colonial process grounded in violent dispossession, as it assumes that Indigenous lands are both available (at capitalists' disposal) and pollutable. It also assumes that the people who live in these 'sacrifice zones' (De Souza 2021), inevitably poor and black/indigenous due to the environmental racism embedded in gendered racial capitalism (Pulido 2017), are pollutable and disposable (Liboiron 2021; Doherty 2022; Solomon 2022). Just like so-called disposable people, disposable commodities are not actually 'disposable'—it is just that their harms are felt by people and a planet also devalued by the ideology and practices of disposability.

The production and disposal of commodities in general, and disposable commodities in particular, is therefore intimately intertwined with and dependent on the patriarchal, white supremacist, colonialist assumption that subjugated people and nature are disposable and at capitalists' disposal. For this reason, I argue that it is productive to conceptualize the current phase of capitalism as 'disposability capitalism' to capture the centrality of the ideology and practices of disposability to capital accumulation since the mid-twentieth century.

The concept disposability capitalism is not intended to replace gendered racial capitalism, ecocidal capitalism, heteronormative capitalism, or any similar concept. Ultimately, each of these terms seeks to deepen our understanding of capitalism by foregrounding a specific aspect of the dynamics of capitalist exploitation and accumulation that has received insufficient theoretical and political consideration. To the extent that these concepts are epistemologically, ontologically, methodologically, and politically compatible (which many are due to their common grounding in Marxist method), they can be read together as each illuminating a different aspect of capitalism as a complex whole and providing powerful resources to draw on when analysing and strategizing around concrete issues and struggles.

Drawing together key points raised in the preceding discussion of the role of disposability in the establishment of gendered racial capitalism and the rise of planned obsolescence, I argue that disposability capitalism encapsulates and provides insight into four key aspects of capitalist exploitation and accumulation. First, it emphasizes that the violent dispossession that underpinned the birth of capitalism was facilitated by the ideological assumption that racialized colonized peoples' (and commoners') use of land and resources and the socio-natures they forged were disposable (Simpson and Bagelman 2017; Liboiron 2021).

Second, it highlights that the assumption that specific groups of people and nature can be treated as disposable and at capitalists' disposal is central to capital accumulation. In doing so, rather than focusing on specific power-laden social relations such as gender, race, and nationality through which colonizers and capitalists seek to dehumanize, subjugate, and exploit people, disposability capitalism identifies the common ideological assumption of disposability underpinning the subjugation and exploitation of each of these groups, as well as the subjugation and exploitation of nature. This avoids the problem that arises when a concept such as racial capitalism foregrounds only one axis of exploitation (Go 2021) and the awkwardness of adding multiple adjectives to create terms such as gendered, racial, ecocidal capitalism, which almost inevitably results in the exclusion of one or more subjugated and exploited groups (such as cross-border migrants). Instead, disposability capitalism's focus on the underpinning logic of disposability to capital accumulation calls on us to interrogate who and what capital treats as disposable and at its disposal, and how they are articulated with each other in each specific spatio-historical conjuncture through concrete analysis of concrete situations (Hall 1980). In this sense, disposability capitalism gives effect to one of the most crucial aspects of the South African theorization of gendered racial capitalism, despite the absence of the word 'racial' in the term.

Third, disposability capitalism highlights that waste disposal is a key moment in the circuit of capital and that it is predicated on the violent colonial dispossessions and relations that make land available for disposal (Liboiron 2021; Doherty 2022). This both facilitates a more comprehensive analysis of the politics and political economy of capital accumulation and brings sites typically seen as peripheral to economic analysis, such as landfills, into view as key spaces of exploitation, struggle, creativity, and life that provide crucial insights into capitalist dynamics.

Fourth, disposability capitalism aptly captures the privileged place of disposable commodities and planned obsolescence, intertwined as they are with the production of plastic, in contemporary capitalism, something that

requires urgent attention in efforts to tackle the climate catastrophe (Mah 2022).

In setting out the key aspects of disposability capitalism, it is crucial to note that disposability capitalism focuses on the ideology and practices of disposability through which capitalists see and treat subjugated people, nature, and commodities as disposable and at their disposal. It explicitly does not frame them as disposable, waste, excluded, or superfluous. Instead, disposability capitalism is grounded in Magubane's insight that people framed as disposable by colonizers and capitalists are, in fact, essential and central to capital accumulation and that they contest being framed as disposable (Magubane 2007).

Dispensing Disposability Capitalism

Magubane's formulation of Africans as 'indispensable and expendable' encapsulates and explains the paradoxical treatment of reclaimers as disposable human waste even while they are the bedrock of the industry and provide cities with important environmental benefits and economic savings.

At the same time, through their daily labour and collective organizing, reclaimers present a profound critique of the ideology and practice of disposability, disposability capitalism, and the patriarchal, white supremacist colonial assumptions that underpin them (including that African people can be dehumanized, that they and the socio-natures they produce can be treated as disposable and at capitalists' disposal, that capitalist surplus can be rooted in gross exploitation of their devalued, racialized labour, and that African people should be governed through paternalistic relations).

At the most fundamental level, by salvaging valuable materials from rubbish, reclaimers challenge the naturalized ontology of waste that undergirds disposability capitalism. Reclaimers frequently emphasize that as they salvage items with value, it is the residents who miscategorize items that can still be reused and recycled as trash who should be associated with waste, not them. When reclaimers dig into residents' rubbish bins and extract items that retain value, they conduct a live demonstration right on residents' doorsteps of the fallacy that anything people no longer want can and should be harmlessly disposed as waste so that they can consume more. When combined with political education, as in the case of the ARO separation at source project discussed below, this has radical potential to force residents to defetishize their waste and begin to critique the 'waste-to-consume' ideology that is so central to disposability capitalism.

ARO members insist on being called reclaimers rather than waste pickers, as they understand how associating them with waste misrepresents who they are and what they do and reinforces efforts to dehumanize them and treat them as disposable.⁴ In 2016, at the first mass meeting that led to the formation of ARO, reclaimer after reclaimer stood up to share their pain and anger at how they are dehumanized and mistreated by residents, municipal officials, and industry. As a result, explicitly challenging processes to dehumanize them is central not just to why, but also to how reclaimers in ARO organize. ARO explicitly defines its organizing strategy as ‘organizing the human’. Eli Kodisang, the ARO Coordinator, elaborates that ‘in organizing the human, we need to organize around everything, as the humans who are doing recycling are impacted by everything’. This means that ARO responds to and organizes around all key concrete issues and challenges that reclaimers confront in all spheres of lives (including evictions, funerals, domestic abuse, childcare, inter-gang violence, and migration status, among many others), particularly when they manifest as crises. Kodisang emphasizes that as efforts to dehumanize African people during colonialism and apartheid were profoundly material and not simply ideological, ‘organizing about dignity is not just about how people are perceived in society. It is about their working conditions, their right to work without harassment, and their incomes. It is about the right of their children to be safe, and it is about the right for themselves to be safe, to not be subjected to violence.’

When municipalities and industry in South Africa deign to support reclaimers, they tend to replicate the paternalistic, colonial governance of African people, utilizing a ‘charity model of integration’ in which officials and consultants develop policies and programmes, and reclaimers are expected to be grateful, passive recipients (Samson 2020a). However, as officials and consultants do not understand reclaimers or the work they do, these programmes do not address reclaimers’ needs or interests. They frequently focus on training reclaimers how to identify different types of recyclables, even though this is what reclaimers do every day. In one famed example, the City of Johannesburg built reclaimers a trolley that did not have a handle. Another of the City’s flagship ‘waste picker integration’ projects resulted in the deterioration of reclaimers’ incomes, control over their work, and working conditions. As a result, many reclaimers refuse to participate in or withdraw from paternalistic

⁴ In a similar vein, O’Hare (2022) cites a Uruguayan reclaimer leader who insists on being called a *clasificadora* (classifier), rather than a ‘rummager’. While she does not explicitly comment on being associated with waste, she highlights the fact that they are skilled workers who classify materials according to their value. Citing my earlier work on this issue (Samson 2015), O’Hare notes the ‘hermeneutical injustice’ inflicted on *clasificadores* when officials refer to them as rummagers.

integration programmes, which fail to meet even their own inappropriate objectives (Sekhwela and Samson 2020).

Municipalities in South Africa typically ignore the fact that it is reclaimers who transformed landfills and streets from ‘commodity cemeteries’ into ‘recycling zones of commodification’ and, like their colonial forebears, municipal officials assume that they can simply dispossess reclaimers, treat this new sphere of accumulation as at the municipality’s disposal, and grant for-profit private companies ‘separation at source’ (S@S) contracts to collect recyclables from residents (Samson 2015, 2020b). The reality that reclaimers are essential and not expendable is evidenced by the facts that in Johannesburg and around the world, recycling rates plummet when reclaimers are replaced by private companies and these companies often continue to rely on labour by reclaimers (Assaad and Bruce 1997; Gidwani and Reddy 2011; Demaria and Schindler 2016; Inverardi-Ferri 2018; Samson 2020b).

Since its establishment, the recycling industry in South Africa has been predicated on two key colonial assumptions. The first is that profits can be secured through exploitation of not just cheap, but completely free African labour as unlike private companies, which are paid by municipalities to collect recyclables, reclaimers have never been paid for providing this crucial service. The second colonial assumption is that there will be an endless stream of African people willing to work in these conditions due to the extraordinarily high levels of racialized dispossession, poverty, and unemployment.

ARO is directly countering these assumptions through a number of intertwined initiatives to give reclaimers greater access to and control over recyclables, obtain higher prices, secure payment of a service fee to reclaimers, and transform their position in the recycling value chain. Like many reclaimer movements around the world, ARO was formed to stave off efforts by the municipality to dispossess reclaimers of their access to recyclables, in this case by granting private companies S@S contracts (cf. Chikarmane and Narayan 2005; Demaria and Schindler 2016; O’Hare 2022). After a march in 2017 and threats of legal action, the Interim Johannesburg Reclaimers Committee (IJRC)—which later became ARO—succeeded in halting all but two of the contracts. However, the IJRC understood that protest was insufficient. An emerging body of literature notes that reclaimer organizations deploy multiple tactics—such as combining struggle against and collaboration with the state—to achieve their objectives (cf. Narayan and Chikarmane 2013; Zapata Campos et al. 2022; Carbonai et al. 2023). What has not been addressed in these studies is the political analysis by reclaimers that informs which strategies they adopt, at which points in time, and how they relate to each other.

It is, therefore, crucial to note that it was through conjunctural analysis of the material conditions and power relations in the recycling sector (the same Marxist method used by the original theorists of gendered racial capitalism in South Africa) that ARO realized little progress would be made through directly engaging the municipality, due to its profound ideological commitments to neoliberalized service delivery by the private sector, the city's vision of being a 'World Class African City' (which does not include people salvaging from rubbish bins and pulling trolleys through the streets), top-down governance, and the charity model of integration.

According to ARO's analysis, greater traction could be gained through building solidarity with residents and securing funding from large corporates, which due to mobilization by global environmental movements are currently under significant pressure to demonstrate that they are taking action on plastic waste, and have therefore been willing to provide funding to ARO for projects designed and implemented by the organization (rather than the corporates). As detailed below, ARO therefore developed a strategy of 'encircling' the state by developing and implementing approaches that it believes should be taken to improve reclaimers' status, income, and conditions in partnership with residents and corporates, which can then be presented to the state and PROs as a *fait accompli*, supported by evidence demonstrating their efficacy. As corporates and residents with greater structural power than reclaimers frequently try to coopt reclaimers' work and initiatives (cf. [Zapata Campos et al. 2020](#); [Anantharaman 2024](#)), significant political work has been required to forge respectful relationships and ensure that ARO retains control over each project's vision, orientation, and implementation. This has included developing a set of principles that corporate partners must comply with, being willing to walk away from partnerships, and conducting deep education for partners, including immersion days for corporate representatives.

The first key intervention was the creation of the 'Recycling with Reclaimers' pilot project, in which ARO partnered directly with resident associations in two Johannesburg suburbs to provide a reclaimer-led S@S programme that bypasses the state. Importantly, instead of requiring participating reclaimers to form cooperatives, as is typically the case in South Africa and around the world, the reclaimers continue to work independently and collect the recyclables with their trolleys. ARO's role (which is played by reclaimer leaders) is to provide education to reclaimers and residents, coordinate the relationships between them, manage the programme, and conduct a sweep-up operation with an ARO truck at the end of the day. This innovative approach avoids the problems that frequently arise when it is assumed that

the only way for reclaimers to provide S@S is through cooperatives, which include loss of autonomy, transformation of reclaimers into wage workers, increased work associated with running a cooperative, the high failure rate for cooperatives (which is 92 per cent for the waste sector in South Africa), and the exclusion of the majority of reclaimers in South Africa and around the world who prefer not to join cooperatives (cf. [Godfrey et al. 2016](#); [Sekhwela and Samson 2020](#); [O'Hare 2022](#); [Rosaldo 2022](#)).

Recycling with Reclaimers is predicated on the transformation of social relationships between reclaimers and residents. For example, reclaimers participate in community events and festivals where they educate residents and give children trolley rides, provide logistical support for the events with the ARO trucks, lead clean-up days, and run workshops for adults and children on who reclaimers are, the contributions they make, and how to properly separate materials for them. As a result, more residents greet and engage reclaimers and separate materials for them. Some residents formed an ARO Solidarity Committee to provide support to ARO's wider campaigns, and particularly during COVID-19 lockdowns, residents expressed their appreciation of reclaimers and recognition of their humanity by providing reclaimers with tea, hot soup, and water to wash their hands. As both residents and reclaimers attest, reclaimers have become part of the community, which is a crucially important transformation of urban space in the post-apartheid city.⁵

Recycling with Reclaimers is also significant as, utilizing funds provided by Unilever, it was the first initiative in South Africa to pilot paying reclaimers for the collection service they provide. Through the project, ARO developed and piloted its own preferred approach to S@S and service fee payment to individual reclaimers based on kilograms of recyclables collected, and generated data to support its approach. Based on this experience and evidence, through what [Zapata Campos et al. \(2020\)](#) would refer to as 'governmentality from below', ARO was able to secure language in the Extended Producer Responsibility (EPR) Regulations Amendment of 2021 stating that reclaimers must be paid a service fee from EPR funds, and subsequently negotiated with the Producer Responsibility Organisation (PRO) Alliance that the fee should be based on the weight-based payment to individuals that ARO had piloted. Significant challenges remain in ensuring actual payment, as the PROs have failed to dedicate sufficient resources to meeting this regulatory responsibility. ARO continues to engage the PROs to push for the implementation of

⁵ For more information on Recycling with Reclaimers see <https://wastepickerintegration.org/case-studies/#separation-at-the-source>.

joint campaigns to ensure all reclaimers receive the service fee and is lobbying national government to hold the PROs accountable. At the same time, it is registering reclaimers on payment systems and purchasing materials directly from reclaimers. This enables ARO to secure higher prices for reclaimers through selling larger quantities of baled materials and is positioning ARO to facilitate payment of the service fee to these reclaimers, as it is capturing the weight of the recyclables they collect and sell.⁶

Conclusion

Through their multi-faceted labour and collective forging of creative alternatives to the deeply colonial recycling status quo, reclaimers reveal the fallacies of the patriarchal, white supremacist assumptions underpinning disposability capitalism. As they clearly demonstrate, neither reclaimers, nor nature, nor commodities are disposable or necessarily at capitalists' disposal. However, while reclaimers in ARO are successfully challenging their own disposability, the organization does not yet have explicit, critical positions on either disposable commodities or capitalism. The question that remains is whether and how the reclaimers will take the powerful critique of disposability capitalism that arises from their praxis to its logical conclusion.

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⁶ This section draws on the author's personal knowledge based on her active participation in the activities discussed. She was an official partner in the Recycling with Reclaimers pilot project and led the project evaluation. She led the development, piloting, and initial rollout of the South African Waste Picker Registration System (SAWRPS), is a member of the stakeholder working group overseeing the waste picker integration components of EPR in South Africa, and works in solidarity with ARO in an activist capacity.

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Waste Commoning as Critical Answer to the Property Question

Patrik Zapata and María José Zapata Campos

Commons, Commoning, Waste as a Commons, and Property

Cooking food salvaged from supermarket waste bins, acquiring the know-how to fix one's bicycle in a 'bike kitchen', and collecting discarded materials as part of a waste picker co-operative are just a few examples of how waste can, under specific circumstances, be repurposed as a commons (Gidwani and Baviskar 2011; Gidwani 2013; O'Hare 2022; Zapata and Zapata Campos 2015; Zapata Campos et al. 2023). 'Commons' initially referred to a plot of land, body of water, or forest where community members—commoners—grazed their animals or fished for sustenance. Elinor Ostrom became the first woman to receive the Nobel Memorial Prize in Economic Sciences in 2009 for her pioneering work on these natural commons. In her writings (e.g., 1990), Ostrom cited hundreds of examples of communities' overseeing commons according to self-governance principles, as an alternative to both the state and the market. The notion of commons extends, however, beyond the environmental and rural resources originally studied by Ostrom. Cities themselves can be sites of commons production (Hardt and Negri 2009). Furthermore, commons are not restricted to material resources but encompass knowledge and skills, digital technology and creative commons, and spatial and temporal dimensions, among other categories.¹ Commons

¹ For a broader view of commons, see, for example, Roggero (2010), Harvey (2012), Jeffrey et al. (2012), Dardot and Laval (2014), Stavrides (2014), Borch and Kornberger (2015), De Angelis (2017), and Pellizzoni (2018). Commons can include city parks (Bradley 2015), squares and housing (e.g., Okupa; regarding anti-eviction movements, see Álvarez de Andres et al. 2015), claiming the right to access discarded food through 'dumpster diving' (Barnard 2011), the atmosphere (Gibson-Graham et al. 2016), commons-based housing (Stavrides 2016), growing food in cities (Dobernig and Stagl 2015; Dombroski et al. 2023), educational commons (Means and Slater 2023), time banking (Laamanen et al. 2015), repair

have been defined as a resource that is freely available. Free access to a commons is important because commons are vulnerable to enclosure, that is, some having more access to it than others, destroying it as a commons (Federici 2019). Commons are not for sale but represent a third form of property not regulated by either the market or the state. Throughout history, both the state and private entities have restricted the commons using various means such as enclosures, guilds, feudalism, industrialization, modernity, and, most recently, capitalism with its notion of property (Gibson-Graham et al. 2016; Arvidsson 2020).

As with all property, commons do not emerge out of nowhere. Reappropriation by citizens through political action is essential before they can become commons, and this process is called commoning (Harvey 2012). As Gibson-Graham et al. (2016) have formulated it, commoning is a relational process intrinsically linked to the community that undertakes it, but is also constituted by the act of commoning, resulting in a dialectical relationship between the commons and the commoner community (Huron 2015), and among the commoners in a community. Commoner communities are not homogenous; on the contrary, commoners are individuals with various and often contradictory interests and rationales. Focusing on commoning emphasizes the relations commoning entails. This approach avoids definition exercises about whether or not the commons in question is pure and true, and instead considers who has access to it, who benefits from it, and who is responsible for its care and ownership (Gibson-Graham et al. 2016).

In this chapter we argue that waste commoning offers a critique of the assumption that property can only be either public or private. Waste commoning is a critique in practice, as when commoning, commoners challenge societal norms, myths, values, and practices, pointing towards another way to organize our societies. Often, both state and market capitalism are viewed as the only possible means of such organization, as if they in themselves were complete and functioning systems, which they are not.

First, we illustrate how waste commoning builds on the commoning of insurgent knowledge (Holston 2009) that emancipates commoners from corporations and the state. Second, waste commoning represents small-scale demonstrations that challenge societal norms, including the stigma associated with waste and those in contact with it, and create new practices that cast light on existing pathways towards a more sustainable and inclusive society. Third, as waste commoning is a practice-based critique, it is inherently

potent as it demonstrates the alternative, compared with conventional contention strategies. Fourth and finally, we argue that waste commoning invites a critique of the simplistic public–private property dualism. Instead, waste commoning creates passages that promote the spillover of the commons beyond the boundaries of the commoning community, market, and state.

Next, we present the commons and commoning theory that form the basis of our analysis. Thereafter we introduce three illustrative examples from our fieldwork to elaborate on our main argument. In the concluding discussion, we examine waste commoning as a critique that in practice questions the public and private property dichotomy.

Commons and Commoning

When something goes to waste, it changes ownership the moment it enters the bin (Hawkins 2006). What was someone's property is no longer wanted and is thrown away. When something is thrown away, it usually becomes the property of whoever handles it thereafter—for a fee, because handling waste entails costs. The unwanted property that was wasted can thus become a resource from which one can earn money, by exploiting it as a material resource or by providing service for its handling. Waste as a resource leads to an increased demand for waste and therefore to increased waste production, as with any resourcification (Corvellec 2025; Hultman et al. 2021).

At a societal level, waste is viewed and handled according to the prevailing waste regime (Gille 2007). In Sweden, for instance, the current waste regime shifted from 'less landfill' in the late twentieth century (Corvellec and Hultman 2012) to 'waste is a resource' (Hultman et al. 2021). In principle, in formal waste management systems, the waster must pay someone to collect and treat the waste, be it plastics, radioactive waste, spent bullet casings, used toys, or torn fishing nets. Either public or private actors are paid to handle the waste in one or a series of waste management treatment methods, including storage, incineration for energy, recycling, or reuse (Corvellec et al. 2012). However, this transfer of property and responsibility does not necessarily equate to efficient or sustainable waste management.

This is where waste as a commons and waste commoning come in. Not all waste can be turned into a resource by waste actors in formal waste management systems. Much waste is seen as useless material that takes up space in landfills because it cannot be incinerated efficiently enough (Zapata 2013) or is not seen as technically possible or economically worthwhile to recycle or reuse. The commoning process of 'transforming waste into a commons' first

involves making waste and its value visible: this is how dispossessed communities create their own commons, by ‘creating and appropriating their own resources’ (Zapata and Zapata Campos 2015, 95). By doing this, commoners acquire expertise and competencies that arise from their proximity to and familiarity with waste materials. As Star clarified, commoners attain ‘a naturalized familiarity with the infrastructure and its objects’ (1999, 381). By waste commoning and within their community, commoners can develop the practice-based knowledge necessary to access, identify, transform, and use the waste commons (Zapata Campos et al. 2023). This knowledge is a basis of what Holston (2009) has called ‘insurgent citizenship’, an insurgent knowledge that challenges and questions established knowledge and technological assumptions (Gutberlet et al. 2021; Zapata Campos et al. 2021).

However, access to resources and their visibilization are preconditions for, but not a guarantee of, the transformation of wasted resources into commons. This transformation ultimately requires political action (Harvey 2012). This involves collective action and will to reappropriate and transform what are perceived as common goods (Hardt and Negri 2009; Reid and Taylor 2010; Jeffrey et al. 2012). Collective action can confront political institutions openly but also subtly by challenging deeply embedded societal norms and cultural institutions (Dobernig and Stagl 2015; Means and Slater 2023), as we will later argue.

This recursive relation between collective action and commoning defines its dynamic, relational, and successive nature (Gibson-Graham et al. 2016; Federici 2019; Brandtner et al. 2023). Collaborative efforts, negotiations, as well as struggles to access, utilize, benefit from, or resist the enclosure of commons are all facets of commoning (Gibson-Graham et al. 2013). The relational element of this process highlights the significance of communities in the act of commoning. As Gibson-Graham et al. (2016, 196) argued, ‘without community, there are no commons’. Simultaneously, communities are not inherently existing entities, but rather are formed through the process of commoning.

This relational character is also what makes it possible, or even plausible, for commoning communities to bring together market and state actors within antagonistic relationships in what Gibson-Graham et al. (2016, 194) have called ‘multi-species communities’, as opposed to a well-defined, more homogeneous community of peers.

Consequently, commons ‘are never complete and perfect, and may even have components that contradict the ideal type’ (Eizenberg 2012, 765), sometimes creating a paradoxical mix of instances of commoners, market, and state simultaneously represented by and depending on one another.

For instance, access to closed and unmanaged resources such as waste in a landfill can be shared by adapting public infrastructure to grant access to waste for waste pickers, rather than changing ownership. Furthermore, rescuing abandoned bicycles can take place in both publicly and privately provided space, and dumpster diving entails transgressing the boundaries of private or public property to retrieve discarded food and transform it into a commons.

According to [Gibson-Graham et al. \(2016\)](#), ownership is a legal matter and resources can be used, accessed, managed, and enjoyed by commoning communities regardless of the type of ownership. Commoning communities can create a common space between state and market that is porous and permeable ([Hardt and Negri 2009](#)). Commoning practices and communities can traverse various spaces—be they market, state, or commons—as explored by [Zapata Campos et al. \(2020\)](#). Such practices encompass non-market mechanisms as well as markets and go beyond the conventional public–private–commons framework towards a ‘commons identikit’ built of sharing relationships ([Gibson-Graham et al. 2013](#)). This identikit is based on the ways in which commons-related access, use, benefits, care, and responsibility are enacted in a process or practice rather than a property of a resource or category. These processes may comprise both market and non-market mechanisms, such as public, private, and commons property. In the words of [Gibson-Graham et al. \(2016, 209\)](#), ‘the post-capitalist project is not necessarily anti-capitalist’, and as [Arvidsson \(2020\)](#) has reminded us, the market is older than capitalism: ‘Markets are universal in recorded history, going back at least to the origins of urban civilization. Capitalism is more recent ... this perspective opens up the possibility of non-capitalist markets’ ([Arvidsson 2020, 6](#)).

It is how commoning invites us to reconsider ownership that is the focus of this chapter. In the next section we illustrate the discussion of waste commoning in three cases that form our starting point for the concluding discussion.

Three Examples of Commoning

Three examples of commoning are presented below: bicycle repair, waste picker innovations, and food saving. These illustrative cases derive from our research on waste prevention and changes in local sustainability policies in Gothenburg ([Zapata Campos and Zapata 2017, 2019; Zapata Campos et al. 2020](#)) and from our research on waste commoning communities in Latin America and East Africa since 2009 ([Zapata and Zapata Campos 2015](#);

Zapata Campos et al. 2021, 2023). These cases present distinctive examples of waste commoning as a critique that in practice questions the public and private dichotomy and counters the established societal order and norms.

‘Bike Kitchens’: Repair Communities

‘Bike kitchens’ are collective bike repair communities where users can borrow tools to fix their bikes and where abandoned bikes are recovered and given to members who are taught to repair them. Bike kitchens are parts of a global, open-source, do-it-yourself movement organized as non-profit organizations and generally run by volunteers (Bradley 2018). In Gothenburg, thousands of bikes are abandoned every year when residents move away or children grow up. These numerous unclaimed bikes are collected, stored for three months as stipulated by law, and then usually sold as scrap. The Gothenburg Bike Kitchen takes advantage of this wasted property, claiming the right to reuse and repair the wasted bikes or use them for spare parts when teaching members how to repair bikes.

Teaching people to repair their bikes is the most important activity and goal of the Gothenburg Bike Kitchen, and the claim is that this will help people ‘take care of what they have’. Repairing is also a means to escape from the consumption society, ‘to reuse goods that do not need to be bought again’ and to ‘repair and reuse things’, according to Bike Kitchen volunteers (Zapata Campos et al. 2020).

For some members, repairing means a lifestyle of lower expenditures, less dependence on work, and more free time, a life of voluntary simplicity, minimalism, and frugality. It is not just learning to repair bikes that is appealing, but, more specifically, the idea of sharing that knowledge: teaching and learning from one another. According to one participant, ‘Some people come here and stay and think that it is fun to be here, that it is fun to help other people.’ The social dimension of being together and learning to repair bikes is another important rationale attracting Bike Kitchen members to the repair activities.

For members coming to the Bike Kitchen for the first time and learning to repair even a simple part of their bikes, the learning process can be transformative: ‘Lots of people realize the possibilities that open up, they get excited, realize what they can do ... this is empowering, it can affect how people think’ (Zapata Campos et al. 2020, 8).

One day in May we followed a few students the day before a Re:Cycle day, an event regularly organized by university students in collaboration

with the Bike Kitchen to collect abandoned bicycles and help students to repair them. After several stops at different housing companies where abandoned bikes were collected, we brought them together and lined them up on campus grounds. It was an impressive sight, hundreds of bikes in all shapes and sizes, from total wrecks with parts missing, to bikes nearly ready to use after some maintenance in the form of cleaning, lubrication, and general care.

All those bikes would have been discarded by the housing companies at whose properties they had been abandoned, to be treated as scrap by a recycling company if they had not been collected to be repaired and put into continued use. There they stood, saved and ready to welcome their commoners and new owners. As we contemplated the bikes before us and the next day's event, a thought struck one of us: 'You know ... you've put in so much effort to collect and save these bikes, but here they stand, unlocked and unguarded. Aren't you concerned that anyone could steal them tonight?' One of the bike savers answered, with a smile: 'It would be fine if the bikes were stolen—the goal would be achieved, they would be rescued and used.' It is not the motive for rescuing the bike that matters, it is that the bike is used. Whether one is given the bike or steals it does not matter.

Know Your Waste (Dump)

To anyone having walked on an open dump, expanded polystyrene (EPS)—often called Styrofoam—is a well-known sight. It is everywhere, white, bulky, light, and supposedly recyclable. However, it rarely is recycled because EPS is not considered worth the expense by the formal recycling industry: producing new EPS is easier and cheaper. For Marcelo Loto, a waste picker from Buenos Aires and founder of the Recycling Dreams cooperative, this is frustrating and unacceptable. He and his colleagues at Recycling Dreams have experimented with various ways to de-expand the EPS they have collected and make it into sellable polystyrene again. They succeeded at this, but at too high an energy cost. Therefore, they gave up their first idea and instead, by continued experimentation at Recycling Dreams, invented a process in which the EPS is ground, bagged, and sold to construction companies as road fill—a product and a market that the commoners created ([Participatory Innovation Film Research Project 2023](#)).

In another part of Latin America, at La Chureca, the city dump of Managua, Nicaragua, plastics of all types are abundant. The waste pickers collect

the plastics daily; later they are sorted and cleaned by the community at home or in open spaces in the settlements. Finally, the material is sold to intermediaries. The process for metals, rubber, and paper is similar. As in the EPS example from Buenos Aires, the waste pickers, the commoners, see value where others do not, and through their commoning, make it into valuable resources.

As others outside the community noticed this re-creation of resources, their interest grew. In the La Chureca case, municipal waste truck staff started to put aside ‘valuables’ they found during collection, before emptying the trucks at the dump. These valuables were later sold by the staff to intermediaries, commodifying the diverted waste. The public sector then saw and started to take an interest in the abandoned property that had until then been exclusively wasted, representing nothing but a cost (for transport to and handling at the dump), seeing it as potential income, and began planning a recycling plant where the resource could be separated and recycled (Zapata Campos et al. 2023).

The commoner community observed both the market exploitation upstream from the dump and the potential enclosure from the public; they saw the danger of the commons being destroyed from two directions and started counteractions to defend what they saw as their property. They blockaded the dump and kept it closed for several weeks. After negotiations, the city and the waste pickers agreed on rules for city staff, so that they would not pre-sort the waste. The other threat was more difficult to avoid, and the plan for a recycling plant was realized. In 2013, the plant began operation with many former waste pickers employed in it. At the same time, La Chureca and its commons were closed and waste picking was forbidden; if it had not been for the resistance of the community, this commons would have been completely enclosed and lost (see Zapata Campos et al. 2023 for more detail).

Saving Food Waste

Food sharing is, as in the case of the Bike Kitchen, a global movement that has developed physical and digital infrastructures, with public food-sharing points and open-source digital platforms (e.g., karrot.world), to prevent edible food from ending up in the waste bin. Food whose recommended date of consumption has passed is collected by volunteers from cooperating partners such as supermarkets or bakeries and transported to delivery points open to the public, where no money or reciprocity is required in exchange for the food (saving the partners’ waste collection fees if the food had been wasted).

In Gothenburg, inspired by the food-sharing movement in Germany, the first Solidarity Fridge was created in 2015. In 2022, with ten Solidarity Fridges (distribution points), the effort saved over 160 tonnes of food waste from over 25 grocery stores and bakeries, engaging more than 120 active participants in food pick-up and distribution, while several thousand users benefitted from the regular food deliveries every week (Solikyl 2023). However, keeping distribution points open is difficult in Gothenburg, which, like many cities, is undergoing high-end urban development in its central parts. This redevelopment resulted in the demolition of a commoning space in the Kommersen flea market, leaving the city practically without such spaces in the centre of the city.

Frustrated by the impossibility of finding central spaces for food-saving distribution points and for citizens to practice commoning (in the repair or food-sharing movements), the present authors started a food-saving initiative in 2022 in the premises of the Business School at the University of Gothenburg. With this initiative, we, as research activists, ‘aimed to anticipate that universities can be open spaces to citizens, that our facilities can be used by citizens to practice sustainability, and ... [that] both students and staff can work as peers challenging roles and hierarchies’ (GU Journalen 2022).

Some institutional work was needed to start commoning food waste at the university. The faculty leadership quickly saw a benefit in supporting this initiative and did so. After just a few distribution events, the initiative was already mentioned in the yearly sustainability report of the school—the commoning initiative was quickly co-opted by the institutional sustainability work. More difficult to handle than the leadership were practical obstacles such as rigid norms concerning access to public infrastructure spaces, such as the university’s premises, and strict interpretations of health and safety directives for food handling.

Also, societal norms and taboos about who deserves food waste (‘Can’t business school students buy their own food?’) and the stigma associated with the consumption of food that supposedly was waste (‘Can waste be eaten as food?’) had to be overcome. Some participants were initially suspicious about the origin of the food, while others were hesitant about whether they had the right to consume it, rather than people in greater need of it.

However, for the initiative-takers, what was important was that the food should be eaten rather than wasted, not by whom. The media were also intrigued by the morality of university students consuming food waste. On Swedish Television, a journalist interviewed students and staff, intrigued by their views about who has the right to food waste:

JOURNALIST: Do you find that this food is helping you as a student?

STUDENT: Absolutely. See all these people here. They come with their bags to collect food. Before inflation increased the food prices, one thought [of saving food] more in terms of environmental reasons, now it is like it is more for economic reasons. It is impossible to buy as much food as before.

JOURNALIST: Isn't it more important to offer this food to more vulnerable people?

INITIATIVE TAKER: That is an issue the students also reflected on when we started the food-saving network. But when you go to a grocery store and see for yourself how much edible food is wasted, you realize that unfortunately there is food waste for everybody. We save food from being wasted.

Concluding Discussion

These three examples demonstrate how waste commoning provides a critique of the prevailing societal order and the perception of property as necessarily either public or private. Through its insurgent knowledge, small-scale practices that question structural norms, and critique through action, waste commoning points towards alternative ways of organizing. In the concluding discussion below, we draw conclusions structured around insurgent commoning knowledge, challenged societal norms, and the entangled rationales and relations of waste-commoning communities.

Commoning Insurgent Knowledge

While in many of these small-scale commoning examples the materials, such as repaired bikes and food, remain privately owned by individual commoners, it is the required knowledge that is being commoned. Acquiring knowledge is crucial for attaining the skills required to repair a bicycle and prepare and store food. Repair movements, such as bike kitchens and electronic repair communities, share knowledge of repair techniques to promote repairing skills. Similarly, food-saving communities share knowledge of how to locate, sort, and prepare food. The example of the dump also features knowledge as a commons. To be able to pick from the jumble of a city dump what is worth investing energy in calls for knowledge, and this knowledge is what was shared among the commoning communities of waste pickers.

This knowledge is not new. Design for obsolescence has deliberately hindered self-repair practices outside corporations (Verbeek 2004), and the

consequent deskilling of urban populations has led to growing volumes of waste (Graham and Thrift 2007). These commoning communities bring back the subjugated knowledge that has been disqualified as obsolete and unmodern (Foucault 1980) but that used to be common a few decades ago. The commoners restore knowledge to the community so that its members can repair and maintain their personal property, decreasing waste production, and lessening dependence on corporate goods, services, and commoditized knowledge. Through recreating and disseminating what used to be more common knowledge, such as repair and food preservation techniques, these communities challenge the increasingly dependent relationship between consumers and corporations. That is, they question the privatization of knowledge and its commoditization, in contradistinction to knowledge as a commons, as a public right accessible to those inside and outside the community.

By so doing, these small-scale commoning communities are contesting and countering the regime of waste ownership, empowering and emancipating users, constructing collective knowledge, and thereby questioning whether ownership can only be public or private. In other words, they challenge capitalocentric power by producing and sharing transparent insurgent knowledge about, for example, how commodities function and who owns them, has access to them, and can benefit from them.

Taboos and Changing Societal Norms and Morals: Is Commoning for Everyone?

In our illustrative examples, both business school students and waste pickers in dumps needed to confront assumptions of risk and danger, as well as the stigma associated with the handling and consumption of food waste. With their food-waste-preventing actions, these heterogeneous commoning communities saved food from being wasted. They did so by challenging societal norms and taboos, but also by their civic 'disobedience' of state rules not recommending the consumption of food after its expiry date and by articulating alternatives to the market mechanisms that have failed to prevent this food from being wasted. These food-commoning communities have pressed corporations to initiate changes. Even supermarkets that give away food that has passed its best-before date are changing their norms. Laws are being passed, starting in France, where it is now illegal for supermarkets to dump food, whereas before it was illegal (and still is in many countries) to recover food by dumpster diving. Core questions are who owns food (waste, at least) and

why we overproduce food only to waste it. Dumpster divers, but also food-saving communities that collect expiring food at supermarkets and bakeries, are challenging the legal boundaries of what is private property and what is a commons.

Moralizing, as seen in the examples in this chapter, is present because who is considered fit or not fit to save food is somewhat surprising. On one hand, there is an urge not to waste food; on the other hand, there is the norm that a member of society should be able to pay for food, and that only the poor (enough) are entitled to use wasted food. These conflicting virtues of not wasting and of helping the poor met at the food-distribution point of a business school; in the end, not wasting seemed to win in this case. Claiming the moral right to use wasted and abandoned objects is a feature common to various common pool resources, recalling ideas of environmental stewardship and societal responsibility for the environmental commons beyond private ownership (Lane and Watson 2012). Claiming the right to use the commons also recalls Harvey's (2012) concept of the 'right to the city', here appropriately exercised on a university campus by sharing wasted food from private companies on public property.

On reasonable grounds, it may be queried whether small-scale local commoning is genuinely significant enough to save us from the multiple planetary crises facing us today (Liboiron 2014, 2021). Do saved bicycles, food, and EPS truly have an impact? The magnitude of waste generated is beyond one's understanding, with most of it being disposed of via different waste streams (e.g., agricultural, industrial, mining, or military waste) that individuals or municipalities never encounter (Liboiron 2014). The small-scale recovery of used products cannot effectively compensate for the quantities of waste generated upstream before products reach consumers (Lepawsky 2020).

'No' is one answer and 'yes' is another to the scale mismatch problem. The global is always also local. Without the local the global cannot be, and there is connectivity between the micro and macro—to speak in Latour's (2018) terms. To achieve change, actions need to be connected into collective actions and form new institutional settings that stabilize with time (Czarniawska 2004). If waste commoners with their practices can serve as examples, although small in scale, of another way of doing things, then those actions can be connected to others and in turn allow an alternative understanding of our changed context, policies, and politics.

This was written at the end of 2023, the year that 'shatter[ed] climate records' (WMO 2023). In the Anthropocene era with its materiality, we are

in dire need of change in how we organize our societies. But how can this change be achieved? One way to start is to look at what is being done:

Rather than pose the time-honored but often paralyzing question of “what is to be done” to produce change, we chose to marshal examples of “what is already being done”, thereby contributing to the credibility and strengthening of alternative economies. (Gibson-Graham and Roelvink 2010, 331)

A later study by Dombroski et al. (2023, 1) has acknowledged the strength that a commoning community brings: ‘commons can be thought of as an infrastructure of care for the counter-city, providing the conditions for the emergence and cultivation of collective caring urban subjects’, following an ethics of the Anthropocene (Gibson-Graham and Roelvink 2010) based on ethical economic practices that involve the being-in-common of humans and the more-than-human world.

These small-scale postconsumer commoning practices cannot by themselves effectively challenge the magnitude of waste arising upstream. They can, however, contribute to the norm change that is necessary in order to create structural and systemic norms that address waste arising upstream and how waste (or products before being wasted) is produced in the current production order. If examples of what is already being done can be spread, the ‘commons identikit’ (Gibson-Graham et al. 2013) can be shared further with more localities, which can connect and criticize, question, and counter the way things are done.

Who Is a Commoner, Their Relations, and Entangled Rationales

The examples show that these small-scale commoning communities are political through action, by their doing. This calls into question strict definitions of ‘commoner’ and ‘commoning’ limited to those who are politically engaged and voice their engagement in opposing the enclosure of the commons through open protests and contestation. Instead, anyone who takes part in commoning activities becomes a commoner, regardless of their motivations, intentionality, or time constraints, sometimes without realizing it—for instance, when using a bicycle that was rescued from abandonment before it was restored. These small-scale commoning communities are primarily doers and it is with their waste-commoning practice that they articulate critique, rather than with words. Waste commoning is political as it in practice

answers the property question by showing that ownership can be more than just private or public.

The configuration of these communities also illustrates the issue of with whom commoners have relationships. Repairing bikes and saving food calls into question the hegemony of corporations over customers/consumers but also allows for access to the commons through relations with those corporations (e.g., food stores and housing companies) and municipal organizations (e.g., for space). In the case of ground EPS, the commoning community established business relationships with corporations, enabling both access to and sales of the saved material. Such communities exemplify ‘multi-species communities’ (Gibson-Graham et al. 2016, 194) and their relational character that bring together commoning, market, and state actors, at times with antagonistic relationships.

This raises the concern that commons such as waste are vulnerable to enclosure (O’Hare 2022) for exploitation as ‘untapped potential for capital’ or subject to being forced into ‘capitalistic discipline’ (Gidwani 2013, 777). However, these outcomes may not occur as quickly or easily as anticipated. Commoners’ resistance is multidimensional, providing commons communities with flexible boundaries and pathways that facilitate exchange between commoners, the market, and the state. This alternative balancing operates at the edges of urban societies, simultaneously reducing waste. In practice, waste commoning critiques societal norms, myths, and orders, including the public–private dichotomy. In its critique, it highlights new possibilities for more sustainable paths ‘away from accepted regimes of truth, away from metanarratives and what is taken for granted, and towards alternatives and changes in practices’, as we read in the opening chapter (Corvellec 2025). Small-scale waste commoning represents an alternative to the market and state mechanisms that have led our planet into becoming a huge dumpster. Defending commoning against the persistent challenge of enclosure from the public and private is therefore imperative.

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Mother Earth and Her Three Little Wasteful Pigs

Waste Reduction through Degrowth

Myra J. Hird and Gabriella Dee

Introduction

Humanity is facing environmental crises whose convergence amounts to, if not species extinction, then a greatly reduced and impoverished survivor society. This chapter considers waste as a major contributor to this confluence, and our responses to its looming environmental, human health and wellbeing, and social justice consequences. Borrowing from the well-known Three Little Pigs fable, we explore the concept of degrowth as an increasingly proffered solution to our planetary waste crisis.

Mother Earth's oldest child—the first little pig—represents our current way of living. Present-focused, insatiably craving immediate gratification, and hubristic of his own technological prowess, this little pig lives in the straw house that he built from ever-expanding imperial resource extraction, exerting little effort in acknowledging—let alone dealing with—planetary limits or social justice, swaggering instead in ever-accelerating capitalist growth. This oldest of the porcine siblings confidently reiterates that the solution to the global environmental crisis (the fable's big bad wolf) is to dig more landfills and incinerate and otherwise techno-fix our way out of the global waste crisis. Garbage, the oldest pig confidently asserts, is not trash at all: it is a profit-making resource.

His more mature brother, the second of the three little pigs, sure likes to party with the dwindling number of other privileged porcine of the world but acknowledges his vulnerability to what is appearing to be an increasingly certain catastrophic future. This second brother's wooden house is built with concepts like green innovation, re-municipalization, and circular economy,

and with regulations, transboundary agreements, and policies that seek to modify his older brother's burn-baby-burn approach. These adaptations are necessary, thinks big brother number two, and are eminently viable within a growth economy.

The youngest pig—the black sheep of the porcine family (to mix metaphors)—is tired of her older brothers trashing the planet. Their settler colonialism, land grabs, neoliberal capitalism, and social injustice has rendered her the most vulnerable to an inhospitable future. She knows that she'll need to build her brick house with what her brothers dismiss as 'radical thinking': degrowth through reduced extraction, manufacturing, consumption, and disposal. Undeterred by her brothers' deriding her efforts as impractical, anarchic, or pure fantasy, this youngest pig knows that degrowth is already afoot. She is galvanizing global efforts to build a civic ecology. Part of the younger generation, this pig is learning from small community initiatives to reuse, refurbish, and share products, and social movements such as voluntary simplicity, low technology living, slow shopping, and more. The youngest pig is re-orienting our understanding of the global environmental crisis away from technological fixes and individual responsibility for post-consumption waste, and towards waste (and its associated environmental crises of climate change, biodiversity loss, and so on) as a global social justice issue.

Drawing from a range of (supra) government, industry, and non-governmental organization reports, engineering and science waste management literature, and the burgeoning social sciences and humanities waste studies literature, this chapter uses the analogy of the three little pigs to (albeit somewhat crudely) sketch waste as it is currently managed: initiatives that promise to tackle the waste crisis (here, the big bad wolf) while largely adhering to modernity's capitalist political economy; and calls to action that radically inverse capitalism's fundamental axiom in order to degrow the global economy. The current hegemonic waste management system (straw house) treats waste as a problem resolvable through capitalist venture, technological innovation, and post-consumption individual behavioral change. The wood house approach attempts to resolve waste's increasing volumes and toxicity through initiatives such as the circular economy and energy-from-waste that firmly operate within the current economic growth paradigm. The stone house focuses on the waste hierarchy's apex—refusal, reduce, reuse, and refurbish—actions only possible at a global scale through degrowth.

Our Straw House: Maintaining Status Quo

Adding to the worryingly long list of global environmental threats is the mounting volume and toxicity of waste. According to the World Bank, we are currently producing over 2 billion tonnes of municipal solid waste (MSW) per year. This figure is set to rise to a staggering 3.4 billion tons by 2050. These numbers mask an even more sobering fact: municipal solid waste accounts for only a small fraction of the waste we produce: resource extraction, production, distribution, and retail industries produce far more waste than does consumption (Liboiron 2014; Lepawsky 2018; Hird 2021). And even when we just consider municipal solid waste, almost 70 per cent of that waste is packaging that producers and retailers foist onto consumers (Plastics Europe 2018). Plastics pollution alone has emerged as a serious environmental concern (EIA 2023). Over 90 per cent of plastics are derived directly from fossil fuels: plastics and fossil fuel production increase in tandem (Plastics Europe 2022). Unsustainable plastics production has resulted in a 15 per cent increase in greenhouse gas (GHG) emissions from 2012 to 2018 (CIEL 2019). Moreover, of the more than 390 Mt of plastics produced globally in 2021, less than 10 per cent are recycled (Plastics Europe 2022). And plastics take between five and 1,000 years to degrade into microplastics, which effectively last forever (O'Neill 2019). According to the World Economic Forum, a truck load of plastics are dumped in the world's oceans every minute (Pennington 2016) and in 2017, the United Nations declared ocean plastics to be a 'planetary crisis' with about 100,000 marine mammals dying annually due to plastics ingestion or entanglement. By 2050, global greenhouse emissions from the plastics production and consumption life cycle will account for 10–13 per cent of our planet's remaining emissions 'budget' (CIEL 2019, 2020).

The global waste crisis is part of a growing number of environmental, and human health and wellbeing crises: climate change, biodiversity loss, pollution, potable water scarcity, drought, fires, climate refugees, and so on. In order to understand the logic of the increasing calls for degrowth, we need to take stock of our current 'waste maker' (Packard 1960) society. The extensive literature on the Anthropocene analyses the significantly increasing resource extraction, production, distribution, and consumption—and an inevitable increase in waste. Within the latter part of the Anthropocene we observe a dramatic historical shift in dealing with waste from individual cartage and disposal operators to much larger corporations such as Browning-Ferris Industries and Waste Management Incorporated in North

America (Crooks 1993; Melosi 2005; Davies 2008). These publicly traded companies are heavily financially invested in all aspects of waste management, including waste containers, collection and haulage vehicles, landfills, and other waste management facilities, garnering enormous profits from municipalities that spend millions in contracts to these industries. Waste management is very big business: for instance, in 2014, Canada's waste management industries earned nearly \$7.1 billion (Statistics Canada 2017).

As J. B. MacKinnon (2021) points out, no or low economic growth has been the norm for nearly all of human history. As such, the Anthropocene draws our attention to the impact of economic growth on the vastly increased production of waste. Economic growth is the foundation of our contemporary global neoliberal capitalist system. Significantly, capitalism owes much of its global reach and success to settler colonialism and empire. While bulky, using the term (settler)colonial neoliberal capitalism is critical because it is the *convergence* of these distinct structures, forces, policies, and practices—that explains the justification of degrowth as halting the environmental, human health, and wellbeing devastation that these forces (and their interactions) have wrought. Economic growth is so fundamental to our understanding of how developed, civilized, and advanced a country is that the Gross Domestic Product (GDP) is the almost universally accepted measure of a country's economic success, a point we will return to in a later section.

In response to the rising volumes and toxicity of waste globally, federal governments, supra-national organizations such as the United Nations, and non-governmental organizations have adopted the Waste Hierarchy—a tool used to determine how to best manage waste. Originally illustrated as the five-rung Ladder of Lansink with the categories Prevent, Reuse, Recycle, Incineration, and Disposal from top to bottom (Lansink 2017), the ladder symbolized hierarchical—from best to worst—ways of dealing with globally rising volumes of waste. Various national governments as well as organizations such as the Zero Waste International Alliance (2023) have modified the Waste Hierarchy to suit their priorities. For instance, the federal government of Canada has adopted a six-rung hierarchy illustrated as an upside-down triangle starting with waste prevention/reduce, and followed by reuse/repair, remanufacture/refurbish, recycle, energy recovery, and landfill (Government of Canada 2021a). Waste prevention appears at the apex because reduction should be 'the first priority ... both at the manufacturing level and by consumers and institutions' (2021a, 13). No matter the permutation, though, the foundational argument is that we need to 'climb up' the Waste Hierarchy from disposing of waste to preventing or reducing

waste in the first place. And while many countries have enthusiastically and officially adopted the Waste Hierarchy, the overarching response to waste remains stubbornly at the bottom (disposal/landfill) and only slightly higher up (recycle).

Plastics and other waste (particularly from extractive industries) are exponentially increasing as resource extraction, manufacturing, distribution and consumption are increasing (Arboleda 2020; Jarrige and Le Roux 2020) all of which are key to our current capitalist economic system, which depends upon economic growth through product and services growth. As the rather fatalistic saying goes, nothing escapes capitalism's reach. Capitalism captures every aspect of living and dying possible: from necessities such as food, water, clothing, and accommodation, to every lifestyle element that we can imagine. Indeed, as soon as a component of 'living well' can be imagined, capitalism figures out a way to commercialize and profit from it. And waste is no exception. Such design developments as planned obsolescence (of quality, desirability, and/or function) capitalizes both technological innovation and human psycho-social needs for community to produce constant and increasing discards as so-called product improvements appear (Packard 1960). Planned obsolescence reveals that waste is entirely purposeful within capitalism, and part of the general rise of what we now call consumer culture, or more generally consumption society (Strasser 1999). As the third little pig gets her say in a later section, the latter term masks an inconvenient truth: consumption society turns out to be a very exclusive society that includes only 17 per cent of the global population. The rest of humanity largely consumes as it has always done; within its means and within our planetary limits. This does not mean that the majority of people living within planetary boundaries are not living with ever-increasing volumes and toxicity of waste: waste tends to flow from Globalized North to Globalized South through waste exports, and poorer countries lack the resources to construct and maintain landfills rather than the much cheaper option dumping waste—at considerable human health and environmental cost.

Therefore, neoliberal settler/colonial capitalism structures the way in which we understand waste as a problem, and how to solve this problem. Waste is understood as the inevitable—but controllable—excess of economic growth. And the solution is an entrepreneurial approach to profit maximization through private industries disposing of, and/or recycling, waste for profit. This solution cleverly masks the fact that, overwhelmingly and by orders of magnitude, almost all waste is produced before end consumers enter the waste picture. Hird's (2022) term for this, the 'problem of amplification,' explains how and why manufacturing and retail industries, as well as

governments and (misled) members of the public frame waste as a problem of post-consumer waste, and therefore consumer responsibility. The emphasis on individual responsibility operates within a capitalist rationale to manage waste in ways that do not disturb ever-increasing circuits of mass production and consumption (and therefore industry profit), producing an almost exclusive orientation towards downstream (disposal and recycling) responses to waste (Hawkins 2006; Kollikkathara et al. 2009; Lynas 2012). And to suggest anything else is to call for the downfall of society, to invoke chaos out of order, to be 'anti-society'. We are so utterly politically and psychologically tethered to economic growth that the International Energy Association states that it is absolutely feasible to decouple economic growth from climate pollution (i.e., waste), but that degrowing the economy is 'unthinkable' (MacKinnon 2021, 64). In short, what economists call No Growth Disaster amounts to a scare-mongering equation: no growth = disaster. That is to say, degrowth equates with anarchism and the destruction of 'life as we know it'. As such, reaching the apex of the Waste Hierarchy while inhabiting the first little pig's straw house remains largely aspirational.

The Wood House: Improving the System

The second little pig is becoming more and more aware of the effects of climate change. In four straight days in July 2023, the global average daily temperature was the highest in recorded history, and possibly the highest in 100,000 years. Companies are starting to feel the proverbial heat from activists extolling the role that overconsumption plays in the climate crisis and are redesigning their marketing campaigns to demonstrate responsible environmental policies. More global consumers (with the financial means to do so) report that they are willing to pay more for environmentally friendly products and may be more likely to purchase products from firms they consider to be socially responsible (de Freitas Netto et al. 2020). This is driving companies to proclaim that they are integrating social and environmental concerns into their business operations but has also led to companies claiming to have higher environmental performance than they actually do, a form of greenwashing. Yu et al. (2020) found that more than half of the 1,925 companies in 47 countries that they studied engaged in greenwashing.

Unlike his older brother, the second little pig neither ignores nor explains away the increased flooding, the engulfing fires, and severe heat waves that are now (finally) affecting his privileged way of life. Working within

the global neoliberal capitalist system, second brother pig is modifying his senior brother's tacky burn-baby-burn approach with Circular Economy (CE), Green innovation, Extended Producer Responsibility (EPR) and re-municipalization regulations and policies, and energy-from-waste infrastructure designed to eek as much profit as possible from our abundant, and ever-increasing, waste feedstock. Not much has changed with regards to high-level nuclear waste: industry and governments are still attempting to convince communities (remote and/or poor) to accede to permanent storage repositories that must secure this highly toxic waste for hundreds to thousands of years.

One of the ways in which the second little pig attempts to improve upon his older brother's strategy of dealing with waste is by reorganizing waste's management and its efficiency. During the 1980s and 1990s, in response to growing claims that local governments were inefficient and therefore costing taxpayers, private waste management companies and governments were pressing the case that public services should be managed by for-profit companies instead of bureaucrats; the capitalist logic being that market competition leads to optimum service and infrastructure efficiency at the lowest competitive cost (Voorn et al. 2021). Waste management and other utilities companies (such as water, electricity, transportation, education, and healthcare) promised a superior quality product at lower cost than local government (Voorn et al. 2021). Over time, waste management corporations bought out smaller companies until a relatively few corporations now manage waste globally, reducing competition, creating monopolies and providing what some considered less than optimum service (Hird 2021).

Indeed, there is nothing in the second little pig's arsenal that focuses on reducing the production of waste (Corvellec 2014; Svingstedt et al. 2020). Globally, the most popular form of waste disposal is landfilling (and open dumping) (Hird 2021). Waste has also been burned for millennia, but only recently has incineration's potential energy been collected in order to generate electricity. Energy-from-waste incineration is used primarily in high income and land-constrained countries, increasing from 0.1 per cent to 10 per cent between 2012 and 2018 (mostly due to China's investment in facilities) and accounts for 11 per cent of global waste disposal (Kaza et al. 2018). In Canada, a country with a population density of four people per square kilometre, 3 per cent of waste is incinerated (Government of Canada 2021a), while Japan, an island nation with a population density of 340 people per square kilometre, incinerates 80 per cent of generated waste (Kaza et al. 2018).

Energy-from-waste proponents argue that it reduces the volume of (already produced) municipal solid waste by 90 per cent, freeing up land that would otherwise be needed for landfilling ([Government of Canada 2021b](#)) while at the same time producing electrical power that would otherwise be generated through coal, oil, and/or gas. However, there are downsides to both incineration and energy-from-waste. To run, incinerators—whether they do or do not generate electricity—require a constant supply of feedstock: waste. This means that recyclable materials are re-diverted from recycling back to waste when facilities do not have enough waste to continuously operate. Thus, far from encouraging the reduction of waste, incinerators *require* significant amounts of waste to be constantly generated and available to burn. Another significant problem is that when waste, especially plastics, are incinerated they produce toxic chemicals. In effect, incineration creates its own waste, some of it much more highly toxic than the original municipal solid waste itself. Bottom-ash is typically non-toxic and is, in a few circumstances, used in the construction industry as a road-paving material, reinforcing CO₂ emitting vehicles' hegemony. In other circumstances, metals may be gleaned from bottom ash and reused. Fly ash—the ash that collects at the top of the incinerator's chimneys—by contrast, contains hazardous materials such as heavy metals (arsenic, cadmium, chromium, nickel, lead, and selenium), dioxins and furans ([Huber et al. 2016](#)), and must be disposed of as hazardous waste. In other words, fly ash waste is far more dangerous than the waste that produces it.

As well as the techno-fix promise of waste incineration, the second little pig advocates that we adjust our current economy. The circular economy (CE) seeks to eliminate waste and pollution by redesigning products such that all materials re-enter the economy post-consumption, giving nature an opportunity to regenerate ([Ellen MacArthur Foundation, 2015](#)). As such, the second pig modifies the capitalist economy to emphasize profit from already-consumed materials. According to Lansink, author of the original waste hierarchy (see the previous section), the ladder approach—from the lowest rung of landfilling to the highest rung of waste prevention—stimulates innovation on and between the rungs 'forming the solid basis for ecodesign' ([Lansink 2017](#), 43). Each of these innovations, according to the theory, forms a loop, increasing the circularity of the overall hierarchy. Although some raw materials will always remain essential, and not all waste will be eliminated, the second pig believes that the circular economy will effectively stem the waste tide. Unsurprisingly, private companies, their consortiums and governments are proclaiming the brave new circular economy world as an effective balm to the climate crisis. As a recent report published by the

Global Commission on the Economy and Climate, an international group of economists, government officials, and business leaders, declared:

We are on the cusp of a new economic era: one where growth is driven by the interaction between rapid technological innovation, sustainable infrastructure investment, and increased resource productivity. We can have growth that is strong, sustainable, balanced, and inclusive. ([New Climate Economy 2018](#), 18)

The Commission maintains that ‘the objectives of growth, climate action and development are interrelated and complementary’ ([New Climate Economy 2018](#), 18) and that the circular economy has the potential to not only radically cut the demand for primary resources but to reduce waste as well.

At this stage, the circular economy remains largely theoretical and aspirational, and there are a number of challenges. For one, virgin materials used to make products remain low-cost compared with circular products ([Kirchherr et al. 2018](#)). Theoretically, as companies redesign their products to be more circular, demand will increase and prices will fall, but [Lansink \(2017\)](#) questions whether a rapid and complete transition to a circular economy is possible within global markets. [Kirchherr et al. \(2018\)](#) also concede that the high upfront investment costs of product redesign, the lack of global regulatory consensus on material use and hesitant company culture to invest in redesign due to lacking consumer interest, all contribute to the stagnation of a circular economy transition.

Circular economy critics also cite the Waste-Resource Paradox ([Greer et al. 2021](#)). By turning waste into a resource, critics argue that the result is increased waste production and not the intended elimination of it—in essence a rebound effect (hence the paradox). If a waste stream is turned into a commodified resource, demand increases and overproduction results. Another major challenge is that the circular economy relies very heavily on recycling, a process that is entirely for profit, has negative environmental effects, results in a very limited one or two cycles before the product’s integrity is too diminished (called ‘downcycling’), and requires virgin materials (for instance, in plastics manufacturing—see [Hird 2021, 2022](#)). As such, recycling any virgin material is not part of the CE. Environmental burden-shifting may also occur with circularity: if waste-as-resource is used for downcycling—[Greer et al. \(2021\)](#) use the example of recycled plastics being turned into material for 3-D printing—then the environmental gains of recycling are compromised by the environmental costs of energy consumption.

The circular economy may also have social and human health implications when waste is traded on a global scale, which often leads to discrepancies

about the definition of waste between nations. Broken electronics in the Global North are considered waste, but in the Global South this same material may be viewed as a source of valuable metals (as well as waste) (Gregson et al. 2010; Gregson and Crang 2015). The toxic waste left over after metals have been extracted from discarded electronic devices causes both social and environmental harm, compromising the benefits of the circular economy when assessed at a global scale. Thus, when these factors are considered together, a circular economy with reduced levels of resource extraction, waste, and emissions is far less likely than a shift towards improved recycling and a suboptimal transition from the lower waste hierarchy rungs of landfill and incineration to the slightly higher rungs of material reuse and downcycling. In sum, energy-from-waste, circular economy, and other ‘techno-fix + consumer behaviour change = waste reduction’ strategies remain tethered to economic growth and social injustice (for instance, in rare earth materials mining). As such, we are trying to solve problems with the same type of thinking that created these problems.

The Brick House: System Change

We may appreciate the third little pig’s frustration with her brothers. Her older siblings built their straw and wood houses before she was born, convincing themselves and their social group that unrelenting economic growth in the service of the privileged is the logical order of things (Foucault 1970). The youngest pig rejects her brothers’ framing of waste as either the inevitable cost of doing business (but that is externalized to disadvantaged communities and the environment) and rejects the push to internalize waste into capitalist economic growth through the CE, including energy-from-waste technologies.

The third little pig ‘problematizes the social and economic structures that drive production and consumption, advocating for a society founded instead on sufficiency’ (Savini 2023, 3). There is, and has long been, sufficient evidence to demonstrate that capitalist economic growth causes pollution (Nixon 2011; Liboiron 2021; Hird 2022; Hird and Predko 2023). If something seems too good to be true, it means that someone else is paying. As such, the third little pig frames waste as a social justice issue, focusing on the association between waste and poverty, for instance where open dumps, landfills, and other waste repositories are proposed and sited (e.g., Furedy 1993; Parizeau 2006; Amegah and Jaakkola 2016; Mothiba et al. 2017). As Samantha MacBride and other waste studies scholars point out:

[I]ndustrial zones—the only suitable spots for large-scale processing of recycling as well as garbage transfer, disposal, and incineration—are overwhelmingly near the homes of people of colour and sometimes working-class white people. (2012, 125)

And far from confined to the globalized south, these open waste sites, and their toxicity, are features of the globalized north (Hird 2021).

Straw-housers either live in denial, are obtusely ignorant, or they do not care. It is the cost of doing business, so long as the cost is offshored. Wood-housers recognize the problem but like the citizens of Omelas in *The Ones Who Walk Away from Omelas* (Le Guin 2017), the desire to maintain their paradise outweighs the fact that this paradise requires the sacrifice of others (Le Guin 2017). MacKinnon (2021) makes the important observation that because consumption is relative—a few million are consuming *much* more than several billion—so too is consuming less. In MacKinnon's thought experiment in which the world stops shopping, there is a profound difference depending on how materially wealthy or poor a person is:

In the poorer parts of the world, most households would hardly alter their daily habits, while a minority of wealthier citizens sharply reduce their consumption. In the rich world, the pattern is reversed: a few scarcely notice the difference, while the majority plunge into a torrent of change. (MacKinnon 2021, 41)

And while it is true that the increasing global human population factors into our exponentially increasing waste generation, we are not consuming or wasting the same amounts, nor are we equally experiencing waste's contaminating consequences. For instance, the rich have relatively clean air because they've offshored manufacturing to poor nations. Wood-housers, then, are much more likely to enthusiastically endorse whatever techno-fix is touted to resolve the problem, from biodegradable fashion and chemical plastics recycling to energy-from-waste facilities that promise clean garbage burning, and thus license the continuation of our current global societal metabolism (extraction, production, distribution, consumption, waste). Big engineering promises the citizens of Omelas that they may continue to live in consumptive comfort *and* that the agonized child will suffer no more. It is the brick-housers—the ones who leave Omelas—who are prepared to move the discourse from our current system to degrowth.

The growing literature on degrowth is, unsurprisingly, diversifying the concept and its disciplinary and grass-roots interpretations. In broad brush-stroke, degrowth refers to the inversion of capitalist economic growth: degrowth is anti-capitalist. While degrowth clearly rejects the staw-housers' economic growth at all costs, it also rejects wood-housers' 'greening' of our current global capitalist system. As Fabrice Flipo and François Schneider succinctly put it, 'degrowth signals a radical critique of society: it challenges techniques, rather than just calling for their control' (2014, xxv). Degrowth emphasizes that the growth of our global societal metabolism is in excess of our Earth's carrying capacity: that is, we are using up the Earth's finite resources (Schmelzer, Veller, and Vansintjan 2022). Globally, this is leading—in the case of fossil fuels—to resource extraction corporations investing heavily in 'unconventional fossil fuels' such as those extracted from the Alberta Tar Sands and hydraulic fracturing, which creates even higher carbon emissions (see Murphy and Hall 2011). It also requires the unjust extraction of energy and materials from commodity frontiers on the periphery to past and present colonial centres—peripheries where Indigenous and poor people live (D'Alisa, Demaria, and Kallis 2015). And it is not only the waste of extraction and production but also capitalism's current way of dealing with post-consumption waste: open dumps, landfills, incinerators, and energy from waste facilities are more likely to be sited in, or exported to, regions with less economic, political and social power. Even municipal waste collection, where it exists, is better funded and operated in wealthier neighbourhoods. Degrowth, then, necessarily emphasizes the need for a complete overhaul in waste's governance and management. To wit, while circular economy emphasizes green consumers' responsibility as 'agents of circularity'—and therefore the moral purview is restricted to those with the income capacity—degrowth places the responsibility squarely on waste producers (Savini 2023, 3; see also Hobson and Lynch 2016).

In general, degrowth discourses take one of two forms (with some overlap). Some degrowth arguments advocate for global, whole-system, government-led, top-down systemic change. This is well exemplified by the North American Green New Deal (GND). Fashioned after Franklin Roosevelt's New Deal that was designed to lift working-class America out of its Great Depression in 1933, the Green New Deal proposes to transition to (among other things) clean energy, green infrastructure, and a socially and environmentally just and equitable society. The increasing Green New Deal literature (see, e.g., Chomsky and Pollin 2020; Cox 2020; Klein 2020; Pettifor 2020; Rifkin 2019; Wittman 2023) concentrates on the urgent need to (where possible) transition existing infrastructure and create new infrastructure to shift

rapidly from non-renewable to renewable energy, at the same time creating 'green collar jobs' (Durning 1999).

Within this broadly systemic approach, there is discussion and debate concerning whether degrowth, agrowth, or alternative growth is the most effective approach. For instance, scholars point out that the transition to renewables only means the degrowth of fossil fuels: it actually means the material and economic growth of other (wind, solar, water) energy sectors, as well as increasing resource extraction for the materials needed for renewables (such as electric vehicles), as the Green New Deal, for instance, proposes. And as much as the fossil fuel industry is deploying multiple tactics to slow down the transition to renewables, it is, of course, investing in renewable energy in order to continue to secure capitalist profit (see Graham 2020). Even if governments assumed the financial burden of renewable energy investment, it amounts to economic growth, not degrowth. Degrowth, on the other hand, 'is based on the daily labour of reduction and reuse ... it envisions a society that reuses materials to satiate needs' (Savini 2023, 2).

Also, discussions often posit degrowth in quantitative terms: we need more or less growth in area X (e.g., Holgersen 2023). Part of whole-system shifting means refusing to measure society by this capitalist 'yardstick' (Holgersen 2023, n.p.) and thinking about degrowth in qualitative terms. Others (e.g., Missemmer 2017) argue that degrowth must carefully consider social class complexities: it is difficult to convince working classes to scale down and have less than they already have. Middle classes, on the other hand, are able to choose what to do without, or have less of. Degrowth, as a movement then, must be a critique of Western development; not development per se (Holgersen 2023). One interesting example of such a qualitative evaluation actually uses a quantitative measure. Since the Industrial Revolution, the Gross Domestic Product has become the nearly universal capitalist measure of economic success. Some countries are replacing the Gross Domestic Product with a Happiness Index. Leading the way, since 1971 Bhutan has assessed itself through the Gross National Happiness (GNH) index, 'based on equitable social development, cultural preservation, conservation of the environment and promotion of good governance' (Kelly 2012: n.p.). New Zealand and a few other countries have more recently followed suit. The Gross National Happiness and other initiatives such as the Happy Planet Index signal a move away from capitalist economic growth as the only or most important indicator of civilization, progress, and/or wellbeing.

Degrowth also takes more bottom-up grass roots forms through a diverse set of initiatives scattered throughout various global communities. Slow Shopping (part of the larger 'slow life' movement) encourages people to take

their time while shopping, in order to more fully evaluate whether or not they actually desire a particular product, how long they will use it for and so on (Fulenwider 2016). It is most often referred to as an antidote to Fast Fashion, where clothing is worn for very short periods (either single-use or no use at all) before being discarded. Voluntary Simplicity refers to a lifestyle choice to intentionally scale down the purchase and use of materials for living (Elgin 2010). It contrasts with Involuntary Simplicity, which refers to poverty. The Every One Every Day five-year project began in the London Borough of Barking and Dagenham with the premise that social cohesion is best achieved through group activities. With the help of limited-term financial assistance from local government and NGOs, the project opened a store-front space on the high street, where everyone was welcome to participate together in daily projects such as batch cooking, making, repairing, community meals, playing, and generally sharing skills and resources (We Are Everyone n.d). There are also a number of think-tank type initiatives such as Low Tech Magazine and the International Centre for Anti-consumption Research. As they relate to waste, these initiatives coalesce around a focus on the apex of the Waste Hierarchy: reduction through decreased extraction, production, consumption, refusal, and other means. The great advantage that these bottom-up strategies have is that they are more flexible and adaptable to local contexts. Their disadvantage is that they may remain small, involving dozens or perhaps hundreds of people, who mostly volunteer their time (which means disproportionately women who have sufficient income to engage in volunteer work). The scale-up required to effect global change is immense. And critics call attention to the undeniable social class element to Slow Shopping, Voluntary Simplicity, and other individual-behaviour movements. Degrowth applies to about 17 per cent of the world's population: the other 83 per cent are already practising involuntary simplicity (MacKinnon 2021).

While reuse and refurbishment deal with materials already produced (and thus would involve regulations preventing things like planned obsolescence), reduction focuses on the extraction, production and consumption of goods. We do not want to underestimate the profound impact on waste generation that reduction has: for instance, '[s]hutting down worldwide clothing production for a year would be equal to grounding all international flights and stopping all maritime shipping for the same time period' (MacKinnon 2021, 157). A degrowth approach would also need to consider all of the waste we have already generated, and complex issues such as people who derive their income from waste-picking. While waste-pickers are among the poorest people in the world, the waste management industry is a colossal global money-making business, netting over a trillion dollars and climbing

(Statista 2023). Reining in the waste management industry would require supra- and national organizations and governments to cooperate in massively scaled up Basel Convention-type regulations that would prevent waste exports (forcing nations to deal with their own waste problems). Degrowth would need to move technological innovation away from disposal and limited linear economy mechanisms such as recycling (for instance, chemical plastics) and energy-from-waste that creates linear economy, single-use electricity from burning waste or capturing gas (methane) from landfills. This is a ‘devil-in-the-details’ issue: Green New Deals such as that adopted by Los Angeles assert bold ambitions for zero waste and zero waste-water, but it is unclear how much these ‘zeros’ rely on decidedly non-zero recycling and non-zero linear economy energy. As Savini observes, ‘[r]ather than “down-scaling” the economy, this grows the economy by extending commodity-mediated relations into the realm of waste management’ (2023, 8). Degrowth would therefore require self-sustained and self-reliant modes of urban living that do not rely on waste exports or imports and that strongly disincentivize any type of hazardous waste production (see Meissner 2019; Savini 2023).

Conclusions

Fables convey moral lessons: in some iterations, the first two pigs live lavish lives of instant gratification, and pay for their hubris with their lives, as the big bad wolf (climate change; pollution and so on) attacks their vulnerable homes and kills them both. In other—perhaps kinder—versions, the two greedy brothers escape and find shelter with their youngest brother. In both cases, the third little pig knows the benefits of delayed gratification and frugality, and that hard work pays off.

Only in the aftermath—hundreds if not thousands of years from now—will any debriefing of the Anthropocene’s hard lessons be possible. The business-as-usual linear profit-driven economy very clearly produces ever-increasing volumes of waste. The techno-fix and individual behaviour modification approaches promise sufficient change to avert global environmental catastrophe but their hubris (see Corvellec 2025) reveals that these solutions are also, ultimately, band aids on the deep wound that is settler colonial neoliberal capitalism. As Greta Thunberg bluntly stated in her speech to the United Nations in 2019, ‘We are in the beginning of a mass extinction, and all you can talk about is money and fairy tales of eternal economic growth. How dare you!’

In the fable, the third little pig forgoes the luxurious and frivolous play that occupies her older brothers, and this proves to be her saving grace. Over 80 per cent of the world's population is already doing this through necessity—living frugally with no need to change at all. It is the privileged middle-and upper-classes who must profoundly change from economic and political growth to degrowth. As the harsher of the two fable versions would have it, the two greedy lazy pigs meet with their comeuppance, as their environment (the wolf) kills them. But the fable is just that: in reality, the privileged are still largely able to shield themselves from environmental harm (Szasz 2007). In reality, degrowth requires material resources to build infrastructure. Also, degrowth does not resolve the waste we have already created. Degrowth stems the tide of more—and more toxic—waste; and it focuses attention on equitably reducing the highly disproportionate use of resources and their environmental costs.

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PART IV

TEMPORALITY

Waste, Temporalities, and Critique on Event-Based Environment Justice

A Political Ecology of Slow Violence of China's Production Wastescapes

Kun Wang and Raymond Yu Wang

Introduction

Over the past several decades, much of the environmental justice (EJ) research has revolved around analysing discrete, spectacular, or project-based environmental events (Nixon 2011). These include, but are not limited to, international events of hazardous waste dumping (Pellow 2007), the uneven geographic placement of dangerous or toxic projects and associated intertwining of environment and socio-spatial differences (e.g., race, gender, and poverty) (Bullard 1990), and the grassroots activism that such situations often inspire (Schlosberg and Carruthers 2010). However, it is important to recognize environmental issues as systemic and structural problems deeply rooted in long-term historical, geographical, and political-economic processes (Heynen et al., 2006) rather than imagining them as solely independent or anecdotal events, projects, or social movements. In this light, the *longue durée* concept from the Annales school of historiography, which captures imperceptible timescales, offers a potent lens through which to understand these issues. This perspective encapsulates event, societal, and environmental/geographic/geologic levels (Braudel 1980). Each corresponds to distinct timescales, ranging from short-term, rapidly changing events to medium-term, relatively stable social structures, and finally to long-term, slowly evolving environmental/geographic/geologic conditions. This distinction among different temporalities—event, structure, and environmental conditions—provides a nuanced understanding of environmental complexities, particularly how waste ties event time to the *longue durée*.

Contrasting with spectacular environmental incidents, events, or projects, the evolution of socio-ecological systems is not typically characterized by discrete, node-like snapshots but rather by a long-term, progressive, and insidious historical process. Throughout this enduring socio-environmental transformation, a genuine occasion or platform where stakeholders can concurrently convene, debate, negotiate, and partake in environmental decision-making often does not exist. This is a scenario contrasting starkly with abrupt, dramatic incidents, and societal upheavals and requires the *longue durée* historical analysis of the cumulative effects of varied environmental stressors. Consequently, the issue of procedural justice is often unattainable, particularly under regimes of authoritarian environmentalism¹ (Gilley 2012). Within broader temporal scales, environmental perils exhibit significant geographical mobility and embody considerable uncertainties and intricacies concerning their potential implications for human health. In situations marked by a lack of robust scientific evidence and data, the prevalent response to the accrual of environmental pollution often gravitates towards social inaction, resigned activism (Lora-Wainwright 2021) or quiet activism (Auyero and Swistun 2009). This phenomenon, characterized as the normalization of pollution (Lora-Wainwright 2021) or the silent habituation to contamination (Auyero and Swistun 2009), has been extensively noted among impacted individuals and communities and eventually metamorphoses into a form of slow violence imposed upon marginalized populations (Nixon 2011).

This chapter posits that the event-focused EJ analysis could be enhanced by temporal analysis informed by the *longue durée* concept and recent literature on waste temporalities. Recent literature on waste temporalities has testified that temporality is a critical dimension for deciphering environmental injustices (Nixon 2011; Viney 2014; Davies 2018; Allon et al. 2021; Weber 2022). The overarching thesis is that our relationship with waste is as profoundly influenced by time as it is by space (Graham, Evans, and Duncan 2020; Weber 2022). Across diverse contexts, from landfills, food waste, and nuclear waste to household recycling, analyses reveal that waste-related environmental injustices transpire via numerous, conflicting, and non-linear temporal connections. Conventionally, waste-related EJ studies typically focus solely on treating waste derived from final consumption and the location determinants for environmental infrastructures. Recent waste studies call for expanding our focus on post-consumer waste to unveil the

¹ Authoritarian environmentalism can be defined as a public policy model that concentrates authority in a few executive agencies, limits public participation to a narrow cadre of scientific and technocratic elites, and aims to produce a rapid and comprehensive response to environmental issues while often imposing limits on individual freedoms (Gilley 2012).

myriad discardscapes that surface throughout the phases of production, consumption, and disposal of commodities (Lepawsky 2018). This underlines the need to broaden the scope of EJ research, surpassing the immediate impacts of waste disposal to address the slow violence of broader wastescales throughout the lifecycle of material extraction, production, degradation, and the protracted accumulation of toxins.

Although our initial focus is on waste, the primary aim of this chapter is to critique event-centric EJ studies for their insufficient consideration of temporality. This oversight can, in numerous instances, result in societal complacency or inaction towards the slow violence associated with toxic accumulation. Therefore, it transcends the waste issue, highlighting the processual and cumulative aspects of injustice within the broader environmental context. To enrich the understanding and the critique of the temporal aspects of EJ, we draw upon the distinctions of different temporalities made by the Annales school pertaining to events, structures, and environmental conditions to enhance the understanding of latent and less perceptible structural changes and environmental shifts over the *longue durée* (Braudel 1980). To achieve this task, we employ the political ecology approach to investigate the intricate ways in which temporality interweaves with the environmental justice implications of industrial waste. In alignment with Holifield's (2015) call for a deeper integration between EJ and political ecology, we contend that political ecology is ideally suited to unravel the processual and cumulative aspects of justices. Notably, political ecology is recognized for its strengths in scrutinizing the macroscopic, historical, and multi-scale politico-economic processes that affect the environment, as well as the asymmetrical power relations that determine disparate environmental benefits and burdens. By urging EJ scholars to broaden their temporal analysis, we can penetrate more deeply into the multi-scalar politico-economic processes that underpin environmental injustices. This *longue durée* perspective is crucial, not merely for comprehending how these injustices are structurally engendered, but also for accurately assessing justice outcomes and environmental impacts.

This chapter empirically examines the wastescales in the production sector of China's highly urbanized Pearl River Delta. This analysis uses industrial wastescales to illuminate their reflection of broader political-economic shifts, challenging event-based EJ comprehension. It maps how prolonged, cumulative processes shape intricate EJ scenarios. The conceded harm concept is proposed to articulate precarious scenarios wherein marginalized communities, constrained by limited alternatives, are compelled to engage actively in China's political-economic transition orchestrated by the state and transnational corporations, exposing themselves or geographically distant

actors to environmental injustices. Their willingness to accept risks for immediate enhancement of capabilities (Nussbaum and Sen 1993), raises ethical issues for valid EJ claims. This does not insinuate that vulnerable groups should bear responsibility for the systemic injustices engendered by broader power hierarchies or structures. Rather, it underscores the complexity of slow violence and the failure of slow observation complicated by waste temporalities (Davies 2018). In the context of cumulative pollution, the uncertain temporalities of environmental harms, coupled with the spatial transience of corporations and labour forces, complicates the attribution of responsibility and the determination of disease aetiology. The short-termism, exemplified by local bureaucrats, transnational and local firms, indigenous communities, and rural migrants, all operating at the event-oriented level, generates intersecting and challenging-to-discern *longue durée* impacts on the profound structural and ecological level. Moreover, the examined wastescapes include both industrial and agricultural waste pollution, thereby contesting the prevailing notion that pollution is solely an industrial phenomenon or most relevant to urban environments. This perspective underscores the considerable influence of agricultural waste on local and remote stakeholders (Rogers et al. 2023). It redefines waste to include harmful substances ingested through food chains and industrial byproducts like exhaust gases and heavy metals, emphasizing the long-term threats posed by internalized wastes circulating within the human body rather than externally released ones.

Environmental Justice, Temporalities of Waste, and Political Ecology

From its inception, EJ has been intrinsically linked with waste disposal in both social movements and academic discourse (Bullard 1990). Research employing statistical and GIS-based analysis to explore the correlation between demographic patterns and hazardous or toxic site locations significantly influenced the field's genesis, exposing environmental racism/classism (Bullard 1990; Holifield 2001). Later studies highlighted the crucial role of grassroots activism in combating environmental racism, asserting that these struggles can catalyse transformative change and empower marginalized communities. Notably, indigenous environmental justice claims often extend beyond distributional equity, emphasizing the various capabilities and functionings required for individuals and communities to flourish (Schlosberg and Carruthers 2010). Additionally,

studies have adapted the EJ framework to investigate the transnational trade of hazardous waste and global North-to-South dumping scandals (Pellow 2007).

The symbiosis between critical EJ research and social movements has been instrumental in its evolution and discourse expansion over recent decades (Walker 2012). Likely due to its intimate ties with environmental activism, EJ studies have often focused on distinct or spectacular events (Nixon 2011), such as toxic waste dumping, chemical plant leaks, and the siting of hazardous waste facilities. For instance, extensive studies have explored the correlations between the establishment, selection, negotiation, and location of hazardous facilities and their disproportionate impacts on communities dictated by socioeconomic factors such as race, income, and geography (Schlosberg 2013; Holifield 2015). While this event-centric approach has been pivotal in spotlighting EJ issues, it risks overlooking the majority of silent and cumulative injustices that insidiously and gradually burden the marginalized (Nixon 2011; Davies 2018). EJ movements, for example, the Dakota Access Pipeline protests in the United States, often propelled by event-based dynamics, usually appear as intense, ephemeral outbursts but lose momentum once the acute crisis passes, particularly when scientific evidence of lasting harms is not yet available. Moreover, these movements often assume a steady correlation between pollutant sources and the demographics of affected communities over time. However, this view often conflicts with the realities of many toxic landscapes. The inherent stubbornness, intractability, and recalcitrance of contaminants as the agency of nonhuman actors (Michael 2017) frequently defy immediate and decisive resolutions in the context of environmental injustices, especially concerning disease attribution. The notable temporal-spatial fluidity of both pollutant sources and community populations exacerbates the challenge of accurately tracing pollution and disease origins, rendering these immediate efforts increasingly elusive. These predicaments underscore the growing recognition that environmental injustices are systemic and cumulative, demanding an analysis across more expansive temporal scales to unveil the larger hidden socio-political and economic structures that engender and perpetuate environmental inequalities.

Inspired by the Annales school's distinction between event, structure, and environmental temporalities (Braudel 1980), this chapter asserts that the deficiency of temporal considerations in event-centric EJ studies could be ameliorated by drawing insights from recent literature on waste temporalities.

Reinvigorating the call for temporal expansion in EJ studies, temporality has gained renewed relevance in recent waste studies (Nixon 2011; Viney 2014; Davies 2018; Allon et al. 2021; Weber 2022). First, scholars argue

that temporalities can complement the enduring focus on waste's spatialities and its politics. This shift may stem from critical reassessments of Mary Douglas' foundational framing of dirt as a social and symbolic cognitive category, namely matter out of place, rather than an objective concept. This conceptualization of waste associated with disorder necessitates various spatial strategies such as ordering, management, separation, secretion, or social categorization to contain it, providing a platform for analysing waste-related practices as socio-spatial phenomena (Allon et al. 2021). Vinney (2014) challenges this prevailing spatial conception of waste as 'matter out of place' by promoting a temporally anchored understanding of waste. He contends that excessive focus on waste's spatial characteristics can overshadow temporality's crucial role in shaping our interactions with objects classified as waste. He further proposes that 'waste is also matter out of time' (2014, 2), implying that waste recognition demands a clear negotiation with and articulation of the temporal attributes we assign to things. As Thill (2015, 8) contends, 'waste is everything plus time', encapsulating the concept as a function of material and time. The temporal phenomena, such as decay, duration, acceleration, disruption, and afterlives, indicate how waste persists, evolves, or looms, engendering unequal exposures or unanticipated consequences (Murphy 2017; Allon et al. 2021). In line with temporal reasoning, recent scholarship critiques the overemphasis on post-consumption waste in prior research, highlighting that a significant fraction of waste arises from the extraction or production phase, not just consumption (Lepawsky 2018; Jarrige and Le Roux 2020; Hird 2021). Thus, we need to expand our focus on post-consumer waste to unveil the manifold discardscapes that surface throughout the phases of mining, manufacturing, consumption, and disposal of commodities (Lepawsky 2018; Jarrige and Le Roux 2020; Hird 2021).

Second, research unveils waste's intricate and heterogeneous temporalities (Graham et al. 2020; Weber 2022). Waste practices encompass conflicting timeframes, rhythms, and orientations, often reinforcing capitalist ideologies, for example, the shift of consumption culture from traditional stewardship of objects to throwaway consumption patterns (Hawkins 2018; Weber 2022). Time is not considered a universal or homogeneous phenomenon but rather a complex and multifaceted one shaped by various social, cultural, and ecological factors. Temporal analysis highlights the contrasting time scales involved in consumer culture (where items are rapidly deemed obsolete and discarded) and environmental processes (where waste persists and impacts ecosystems for decades or even centuries). The repercussions of waste production, exemplified by the persistence of radioactive waste, frequently transcend the confines of the immediate timeframe.

The health effects of exposure to pollutants may not manifest until years or even decades later, and the environmental degradation caused by waste, for example, radioactive waste, can persist for generations. In other words, waste endures via unforeseen trajectories, leaving lasting impressions on the present and future (Gregson and Crang 2010). Taking time into account fundamentally redefines notions of waste, value, and sustainability. In essence, without scrutinizing waste's intricate, processual temporality, the meanings, politics, materialities, and spatialities of EJ cannot be fully comprehended or addressed.

Echoing Holifield's (2015) call for a more profound synthesis of political ecology and EJ, this study contends that the political ecology approach is instrumental in decoding the temporal aspect of EJ to yield both more systemic, historicized narratives of environmental contestations and nuanced articulations of everyday grassroots environmental experiences.

Political ecology offers a vital perspective for comprehending the *longue durée* socio-political dimensions of environmental and waste issues that connect event time to structural temporality (Braudel 1980). Firstly, systematic political-economic and power configurations have enduring effects on local communities, especially marginalized groups disproportionately saddled with environmental pollutants, impacting their health, environment, and quality of life. As Jarrige and Le Roux (2020) contend, contemporary contamination that commences with industrialization, by nature, is a social and political fact marked by iterative cycles, power dynamics, and cultural metamorphoses. Regarding waste issues, political-economic transitions often concurrently evolve with the institutional setup of waste policy and governance, (re)producing specific waste regimes (Gille 2007). A political-ecological approach helps to decipher how these policies are formulated, their beneficiaries and victims, and their broader environmental repercussions over time.

Secondly, political ecology highlights a historical co-evolution and entanglement of uneven power dynamics, environmental inequalities, and the production of socionatures/cyborgs (Heynen et al. 2006). In this way, it delves into the subtleties of change, focusing on the often overlooked or unarticulated shifts and injustices beneath the surface of observable phenomena (Jullien 2011). It emphasizes the silent, gradual, and often imperceptible transformations that occur over time, challenging EJ studies that often prioritize distinct, measurable, and overt changes (Jullien 2011). Environmental and waste temporalities involve diverse hidden inequality forms. For instance, future generations may grapple with the fallout of nuclear waste or climate change from waste-related emissions (Bickerstaff 2012).

Through a political ecology lens, these concealed temporal injustices can be revealed by emphasizing the agency of the absent (Bickerstaff 2012). As articulated by Bickerstaff (2012), these absentee actors and institutions constitute a fundamental facet of the political ecology of waste or other environmental issues. The temporally distant actors, alongside larger-scale political-economic dynamics and unseen institutional forces, although often invisible in current conjuncture or at local scales, manifest themselves in contemporary environmental dialogues and significantly sculpt the landscape of present-day environmental injustices.

Broadening the temporal range beyond the traditional waste studies' emphasis on post-consumption waste, the subsequent examination of the Pearl River Delta's industrial and agricultural production wastescapes reveals that a time-oriented perspective, enlightened by the *longue durée* concept, and the recent scholarship of waste temporalities and political ecology, can challenge and supplement event-focused EJ studies.

Toxic Production Wastescapes in the Pearl River Delta

Temporal Evolution of Village-Based Industrial Wastescapes under Fragmented Rural Industrialization

The evolution of the Pearl River Delta's industrial wastescape exhibits intertwined spatial and temporal dimensions. Spatially, the wastescapes demonstrate a dispersed, fragmented village-level pattern, indicating that waste and pollution distribution is not centralized but scattered among numerous villages. They are typified by the existence of small-scale manufacturing units and their contaminated land, water, and atmospheric pollution in villages. Temporally, village wastescapes can be traced back to the prolonged period of rural industrialization that has transpired in the Pearl River Delta, devoid of adequate environmental regulations and governance. The significant acceleration of rural industrialization since the late 1970s, embodying a form of politico-temporal acceleration, is essential for understanding the temporalities of wastescapes within the Pearl River Delta.

The inception of China's industrialization, commencing in the late 1970s, was primarily driven by an export-centric and labour-intensive economy, described as a processing trade regime (Yang 2012). This paradigm has catalysed the unregulated proliferation of rural industries, leading to an exponential increase in waste production. The Pearl River Delta spearheaded this export-focused growth fueled by foreign direct investments, particularly

those from East Asian territories such as Hong Kong and Taiwan. Described by scholars as exo-urbanization led by foreign direct investments (Yang 2020) or as a grassroots rural industrialization transpiring at the town and village echelons (Lin 1997), villages and towns evolved into the production nucleus for global lead firms, generating consumer goods primarily intended for developed countries. As industrial sectors burgeoned, an influx of factories and manufacturing facilities found their way into rural territories, capitalizing on the reduced land and labour costs. These industries frequently suffer from inadequate environmental planning and infrastructure, leading to a fragmented and haphazard development landscape. Firms operating under the Sanlaiyibu (three supplies and one compensation) model played a pivotal role in this processing trade regime. The Sanlaiyibu entities are a variant of foreign-invested business organizations in China that entered into cooperative contracts with town or village foreign economic and trade offices (waijingban) and were registered under the names of their Chinese counterparts. They were typically directly operated and managed by the foreign enterprise, with the Chinese village partner contributing land, labour, and factory buildings for a compensation fee. Subsequently, in the 1990s, town or village enterprises and domestic private firms began to flourish in Pearl River Delta cities, with Foshan City serving as a notable paradigm. However, their emergence, which followed the low-end manufacturing model of Sanlaiyibu firms, merely hastened the expansion of village-based rural industrialization. This dispersion of industries provides a fertile ground for opportunistic environmental practices within these rural industries.

This grassroots, bottom-up evolution of rural industries exemplifies the conceded harm towards local communities. The manifestation of environmental detriments across these village-based industrial wastescapes results from tacit cooperation between the state, foreign and native investors, indigenous communities, and rural migrant workers from other regions of China. Many local people and rural migrants concede the short-termism by arguing that developed nations have likewise traversed this path of pollution, thereby rationalizing their exploitative and speculative conduct towards multi-generational environmental assets (corroborated in multiple interviews 2022). Their proactive engagement with these rural industries must be contextualized within China's dual land ownership system, which pertains to the proprietary rights over state-owned land in urban areas and rural land collectively held by rural villages. While the proprietary rights over state-owned land have been unequivocally delineated, the rights over collectively owned land have been criticized due to their inherent ambiguity and insecurity. This bifurcated land use and governance system serves as the principal

institutional structure facilitating non-agricultural land utilization within the Pearl River Delta (Tian and Zhu 2013).

In the context of land as an urban asset, stringent regulation is imposed by the planning bureaus of municipal governments, whereas decision-making on land use and development in rural areas is devolved to the village level (Tian and Zhu 2013). Disputes frequently arise due to the inadequate compensation city governments provide for appropriating village farmlands. To safeguard the market value of their collectively held land, villages at the grassroots level initiated an autonomous institutional reform. In 1992, the pioneering Rural Shareholding Economic Cooperatives were instituted in Nanhai County, Foshan City, fostering collective industry growth and providing farmer dividends. This trend quickly spread throughout the Pearl River Delta. Most Rural Shareholding Economic Cooperatives evolved to create their own industrial parks. Excluding Shenzhen, the Pearl River Delta is home to 3,853 village-level industrial parks spanning approximately 976 square kilometres, predominantly populated by high energy-consuming, heavily polluting, and low-technology dependent industries (Wang 2019). Rural industries significantly absorbed surplus agricultural labour, initially employing local farmers and later attracting nationwide rural migrants (Lin 1997). Typically, village cooperatives provided land and space, drawing external investors to establish labour-intensive manufacturing industries, thereby augmenting villagers' income and nationwide migrant workers' wages.

The proliferation of innumerable small-scale industries within rural settings has instigated the rapid encroachment of industrial growth upon agricultural land. This has led to a confluence of intensive land uses encompassing both agricultural and industrial production and rural and urban activities. The fundamental nature of this industrial progression, in conjunction with its covert insertion within rural landscapes, has engendered a deleterious and frequently disastrous interaction with the natural environment, thereby significantly harming the local ecosystem. As a correspondent vividly recounts:

In my recollection, the pristine creek and golden rice fields of my childhood gradually vanished with the march of industrialisation, supplanted by turbid waterways and fields cloaked in factory smog... The once starlit night sky is now obscured by the thick smoke belching from industrial chimneys, obliterating the serenity and splendour that once prevailed, perhaps forever. (Interview with a resident in Guangzhou, 2022)

These forms of environmental injustices are the product of broad power structures that involve intricate multiscalar political-economic, sociocultural, and environmental interactions. Globally, contemporary production manifests as organizationally fragmented and geographically dispersed, with global lead firms orchestrating the economic geographies of production, consumption, and dispersion across nations (Yeung and Coe 2015). The pollution heaven hypothesis suggests these entities transfer their lower-tier, pollution-intensive sectors to countries like China, offering cheaper labour, land, and lax environmental regulations. This spatial relocation of pollution-heavy industries signifies an outsource toxicity (Nixon 2011). Notably, subcontractors like Foxconn, originating from Hong Kong and Taiwan and sharing cultural or ancestral ties with communities Pearl River Delta, introduce foreign investment into the Pearl River Delta by establishing labour-intensive manufacturing plants. Nationally, the shift from a socialist to a market-oriented economy has ushered in new economic policies and reforms, with the Pearl River Delta reaping significant benefits. These political-economic adjustments have cultivated a favourable business climate and engendered opportunities for foreign investments. Subnationally, particularly in provinces and municipalities, a proactive response to the central state has been observed through the vigorous solicitation of foreign investments and the advancement of export-driven economies, such as processing trade. Specifically in China, a distinctive urban metamorphosis, termed urban state entrepreneurialism (Wu 2018), has transpired. Municipalities compete fiercely to triumph in the GDP-focused cadre promotion tournament (Zhou 2017), frequently prioritizing foreign investment over environmental considerations.

At the local tier, village Rural Shareholding Economic Cooperatives have expedited rural industrialization by supplying land and infrastructure to industries, thus deriving substantial income from land rents and subcontracting (Tian and Zhu 2013). This accelerated rural industrialization has attracted a multitude of rural migrant workers from less prosperous rural regions of China, migrating to the Pearl River Delta for improved wages. Village properties also provide informal, cost-effective housing for these migrants. The rental economies—whether leasing land to low-tier manufacturing or offering housing to rural migrants—have sustained the ubiquitous presence of tens of thousands of village-level industrial parks, housing innumerable small-scale factories and workshops. The dissonance between full-stomach and empty-belly environmentalism (Guha and Martinez-Alier 1997) is conspicuously evident in this scenario. Local communities grappling

with basic survival necessities often prioritize immediate needs and economic progress enabled by these polluting industries.

The rapid coalescence of industries and labour forces within these swiftly urbanizing rural regions has amplified environmental challenges, creating a complex web of impacts that ripple through the socio-environmental landscape. The health impacts are subtle and long-term, necessitating a comprehensive understanding of the dispersed village wastescapes.

Comprehending the dispersed village wastescapes necessitates an intricate disentanglement of the multiscale socio-environmental relations that are often imperceptible, hidden beneath the surface of daily life and obscured by the immediacy of short-term events. By adopting a long-term historical perspective, we can see how these short-term events and mundane everyday life reverberate at a deeper level, shaping the physical landscape, altering ecological systems, and impacting the lives of local communities. To further elucidate subtle effects on the quotidian environment of local communities and inhabitants, we employ the instance of river sediment contamination, exemplifying the gradual and insidious infliction of environmental harm over an extended temporal scale.

Stubborn River Sediment: Persistent Toxic Industrial Wastescapes in the Epoch of China's Ecological Civilization

Through the lens of *longue durée*, we can appreciate how the transformation of the Pearl River Delta's watercourses into waste repositories is not merely a series of discrete events but part of a broader historical trajectory. It is a long-term process shaped by the interplay of event-level actions (such as the daily operations of industries and the behaviours of local communities), social structures (such as environmental governance regimes), and environmental/geographic/geologic factors (such as the dense river networks). A prominent geographical feature of the Pearl River Delta is its complex labyrinth of watercourses. Over decades of industrialization, these waterways have metamorphosed into the drain conduits or waste repositories for the entire region. It warrants attention that a substantial quantum of industrial contaminants does not simply get swept into the ocean with the river currents. On the contrary, these pollutants accrue and coalesce in the riverbed of the water network, inflicting enduring deleterious effects on the ecological system of the entire region. This tenacious river sediment, manifesting as toxic industrial wastescapes, represents a form of socionature

(Swyngedouw 1996), engendered under the socio-material intertwinements between China's distinct environmental governance regimes and the Pearl River Delta's dense river networks. It exemplifies the incessant interaction and mutual constitution of waste, society/politics, and nature.

Until the previous decade, enforcing environmental laws and regulations in China remained lamentably inadequate despite their rapid expansion. Within the political-economic framework of urban state entrepreneurialism (Wu 2018), Chinese local administrations have adopted a distinctively entrepreneurial stance, competing to foster economic growth and fiscal revenue, regardless of environmental consequences. This situation is exacerbated by the fragmentation of the Chinese administrative system, where local environmental departments are subordinate to local governments, with minimal oversight from higher central and provincial environmental authorities (Tsang and Kolk 2010). As a result, local environmental authorities have prioritized the GDP-focused cadre promotion tournament of municipal governments (Zhou 2017) over complying with the directives of superior environmental authorities (Tsang and Kolk 2010). Given the direct link between GDP growth and official promotion, local officials' efforts inevitably leaned towards economic statistics. This system encouraged local officials to prioritize short-term gains and rapid promotions, leading to an unending drive for investment. From a local official's perspective, minor environmental concessions were acceptable to protect major tax contributors. Their regulatory abilities were restricted to fining polluting village entities, and their calls for production cessation were often merely symbolic, lacking the authority to enforce closure or suspension of polluting enterprises backed by villages. This lax approach fostered a persistent reaction among village enterprises to endure penalties rather than address pollution problems, thereby exposing the critical deficiencies of China's former environmental governance regime.

Over the preceding decade, China has experienced a remarkable transformation in its environmental governance, marked by constructing the political discourses of ecological civilization (*shengtai wenming*). The government has acknowledged the criticality of confronting environmental challenges and has pledged to transition towards a greener, more sustainable economy. The progression towards an ecological civilization symbolizes a commitment to environmental sustainability and a harmonious coexistence between humans and nature (Hansen et al. 2018). Under President Xi's stewardship, this restructuring of environmental governance, whether as a response to escalating domestic and international apprehensions over

environmental issues or a long-term vision for China's development that harmonizes economic growth with ecological responsibility, has superseded the previous emphasis on economic growth, becoming the new strategy for maintaining the party-state's legitimacy of rule (Wang 2013). However, the village-based production of industrial wastescapes in the Pearl River Delta represents the conceded harm with the cooperation of local communities. The fortification of environmental regulation under ecological civilization did not garner substantial local support but instead provoked the resistance of local villages or towns. For instance, the state-led expulsion of pollution-intensive firms prompted grassroots resistance in Dongguan and Foshan (Yang 2012).

Analogous to local communities, the previous toxic river sediment in the Pearl River Delta has proven stubborn to inclusion in China's new environmental agendas, which are highly selective and politicized. The selectivity in the last decade's remediation efforts has focused on eliminating black and odorous water due to its immediate impact and high public visibility. However, the variety of heavy metals in riverbed sludge has been largely overlooked, primarily due to costly remediation and less immediate effects. For example, the Guangzhou Asian Games saw significant investment in river pollution remediation, primarily targeting the removal of foul-smelling and visibly polluted waters. Since 2017, the river chief system reform has become China's national water governance cornerstone. Despite its comprehensive framework, the implementation often simplifies complex objectives to focus on eliminating foul odours and visible pollution. This selective governance approach results in many rivers appearing clean without black or foul-smelling characteristics, despite the water quality often remaining at an 'inferior class V' by Chinese standards, unsuitable for direct human contact. This creates an illusion of cleanliness, and inadvertently increases individuals' exposure to hidden environmental risks. For example, during the ecological space reconstruction in various Pearl River Delta cities, water landscape beautification has been used to enhance land value, attract skilled labour, and stimulate investment. Once polluted and confined, or even buried, rivers have been transformed into riverside parks, wetland parks, and other public spaces. Water cultural activities like dragon boats and rowing races have been revived, turning rivers into historical conveyors and public connectors without perceiving their health risks. The emergence of urban water-friendly spaces indeed offers significant societal value, but it also increases public exposure to river network water bodies, thus raising vulnerability to their contents.

Fragmented Rural Industrialization and the Emergence of Toxic Agricultural Wastescapes

The agricultural wastescapes in the Pearl River Delta encompass two distinct circuits. An initial circuit pertains to the environmental hazards birthed by the swift rural industrialization impacting agriculture. Within this scenario, industrial waste invades the agricultural system as a series of event-level actions, yet metamorphosing agriculture into an extension of toxic industrial wastescapes as ecological-level consequences. A secondary circuit represents a unique wastescape that arises from modern intensive agricultural production. The concern here extends beyond the waste discharged into the external environment, including the waste that transforms human environmental victims into cyborgs (Haraway 1985) through modern artificial agricultural additives. The inability to expel this waste into the external environment implies that these contaminants will infiltrate and persist within the internal metabolic cycle of the human body via agricultural products like fish and vegetables, thereby directly influencing human health. The afflicted human body, in turn, becomes a part of these extended wastescapes. This process, too, unfolds over the *longue durée*, as the effects of these contaminants on human health are often slow to manifest and can persist for generations. The creation of these extended wastescapes is, therefore, not a short-term problem, but rather a long-term, structural issue. It is a cumulative outcome of numerous event-level actions, embedded within larger societal and environmental contexts. For instance, the use of certain artificial additives in agriculture is a practice that occurs within the broader context of the modern agricultural transition towards intensive farming. Furthermore, environmental, geographic, and geologic contexts, such as the centuries-old Dyke-Pond System within the Pearl River Delta, provide the backdrop against which these wastescapes materialize.

Polluted Agriculture as Extended Industrial Wastescapes

The rapid progression of rural industrialization has wreaked significant havoc on agricultural ecosystems. A substantial portion of agricultural lands have been reappropriated for industrial purposes, thereby drastically infringing upon the land and ecological space allocated for agricultural production. Within the distinctive paradigm of rural industrialization, where industrial and agricultural lands, in conjunction with urban and rural areas, coexist in

a geographically entangled configuration, the dispersed village wastescapes enable industrial waste to be directly incorporated into the local agricultural ecosystems.

Firstly, the intensification of industrial activities has instigated the permeation of deleterious chemical compounds, such as heavy metals and organic pollutants, into the soil, exerting a profound influence on soil quality. These contaminants can detrimentally impact crop growth, disrupt the habitat of soil-dwelling organisms, and even infiltrate the human body through the food chain, constituting a risk to human health. Secondly, the release of copious amounts of industrial wastewater has given rise to severe contamination of both surface and groundwater resources. This water pollution presents considerable threats to the safety of drinking water, the irrigation of agricultural land, and aquaculture. For example, in cities with pronounced pollution, such as Foshan and Dongguan, local water bodies have nearly forfeited their agricultural irrigation function due to the intensity of pollution. Thirdly, the frequent industrial production activities in the Delta, particularly the emissions from coal-fired power plants, petrochemical industries, and automobile exhausts, have resulted in a significant volume of acidic gases (predominantly sulfur dioxide and nitrogen oxides) entering the atmosphere. These acidic gases form acid rain in the presence of precipitation. The Pearl River Delta ranks among China's most severely afflicted areas by acid rain pollution. In 2008, eight of the nine cities within the region were designated as severe acid rain zones by Chinese authorities, with an incidence rate of acid rain recorded at 53.4 per cent. Acid rain has precipitated issues such as soil acidification, direct crop damage, the spread of pests and diseases in crops, and water source pollution, for example, acidic water sources are highly detrimental to the large-scale aquaculture in the Delta, potentially leading to mass fish mortality (Interview with an agricultural specialist in Guangzhou, 2022).

Over protracted durations, the uncertainty of the quantification of agricultural waste and the assessment of its environmental impact remains strikingly apparent. For an extended period, the concealment and lack of transparency regarding environmental data in China have been the subject of broad criticism. However, the pollution afflicting agriculture in the Delta is a phenomenon that the public can intuitively discern. Despite the absence of precise data or scientific reports, people remain cognizant of its existence, an unassailable reality. The palpable presence of pollution and the associated accumulated health risks feature prominently in public perception. The public employs slow observation (Davies 2018), a quotidian human sensory experience encompassing visual and olfactory senses, among others,

to gauge and evaluate waste emissions and pollution status. As articulated by a local farmer:

Farmers may not have extensive knowledge, but everyone knows that crops grown on polluted land are noxious, and this understanding does not necessitate any scientific research. The shape, colour, taste, everything is different. (Interview with a farmer in his 60s at Foshan City, 2022)

In response to extensive criticism, certain environmental data has been gradually disclosed over the past decade. In 2013, a high-ranking official divulged that in recent years, more than 46,000 hectares of farmland in Guangdong have been detrimentally impacted by industrial waste, causing a decrease in agricultural yield; approximately 667 hectares of agricultural land have been either deserted or repurposed due to severe industrial contamination (*The State Council* 2013). The results of the National Soil Pollution Status Survey, conducted in 2006, were made publicly available in 2013. Within the Delta, regions of moderate to severe heavy metal pollution constituted 35.9 per cent of the total, while unpolluted soil only comprised 10.61 per cent, with the remainder being lightly polluted. The primary elements exceeding the standard were cadmium, mercury, arsenic, and fluorine. Severe pollution was centred around the urban areas of Guangzhou and Foshan and their surrounding areas, approximately exceeding the standard by 50 per cent. Quality monitoring data of rice and vegetables indicated that most agricultural products in the Delta were significantly affected by soil pollution. Dongguan vegetables' heavy metal exceedance rate had reached 29.24 per cent, predominantly lead, cadmium, and arsenic. The nitrate exceedance rate reached 43.7 per cent, and the organic phosphorus exceedance rate reached 66.0 per cent.

Emerging Toxic Agricultural Wastescapes: Shifting Dyke-Pond System in Pearl River Delta

The progression towards agro-industrialization has emerged as a significant demarcation between traditional and contemporary agricultural practices, characterized by the comprehensive employment of modern agrarian technologies and synthetic compounds in agricultural production. This includes organic compound fertilizers, pesticides, antibiotics, and feed for livestock and poultry, among other elements. The pervasive deployment of these synthetic agricultural strategies potentially obfuscates the demarcation between

humans and nature, as individuals consume contaminated agricultural products. This occurrence engenders a multifaceted interaction and reciprocal influence mediated by the agro-technologies and waste generated through intensive agriculture. While synthetic technological compounds have catalysed an augmentation in agricultural yield, they have simultaneously disrupted the inherent ecological equilibrium of nature. Incorporating these substances into the human physiological system or the broader environmental matrix essentially epitomizes a manifestation of anthropogenic waste. Throughout the continuum of agricultural production, these compounds either subsist as residual byproducts or are released into the environmental milieu.

The complexity of environmental justice scenarios is intensified by the potential health effects of modern agricultural pollution, which may remain dormant and unpredictable for decades, coupled with the imbalanced intra-community distribution of the gains and losses associated with such pollution. For instance, in the livestock, poultry, and aquaculture sectors, emissions and wastewater from feed and animal waste significantly threaten nearby residents' health and quality of life in the Delta. While definitive data on the quantification of this waste, its environmental conditions, and health impacts are lacking, residents do experience tangible effects. Local protests against wastewater and odours from livestock farming are frequently observed (Information provided by two planners, 2023). Furthermore, the environmental release of agricultural waste extends beyond wastewater, exhaust gases, and solid debris. A more pressing issue arises from agricultural industrialization, where toxins infiltrate the human body through agricultural products and food, leading to health issues. As one Guangzhou resident remarks:

In the era in which we are growing up, food quality is truly worrying. Now, people are having so many infertility issues and newborn jaundice problems [...]. I suspect many of these are related to the consumption of these toxic foods. (A young person in her 30s, 2022)

The evolution of agricultural wastescapes is epitomized by the changes in the unique vernacular agricultural ecosystem of the Delta, that is, the Mulberry-Dyke-Fish-Pond System. The vernacular landscape is 'formed by the affective, historically textured maps that communities have devised over generations' (Nixon 2011: 17). Existing in the Delta for centuries, this system represents a highly efficient, ecological, and sustainable agricultural production paradigm, skilfully utilizing local resources while minimizing

environmental impacts. In this system, residents build fishponds in flood-prone areas. Excavated soil is used to create embankments, commonly known as dykes. Mulberry trees are planted on these dykes for sericulture. The resulting silkworm cocoons are used in silk production, while leftover silkworm waste and fallen mulberry leaves are used as fish feed. Conversely, waste and aquatic plants from the fishponds fertilize the mulberry trees, establishing a nearly zero-waste, cyclical, sustainable agricultural system. Unlike modern agriculture, this method reduces reliance on chemical fertilizers and pesticides and provides multiple income sources, including mulberry leaves, silk, and fish. This agricultural model optimizes resource use, reduces environmental pressure, and embodies the local inhabitants' traditional ecological wisdom and environmental knowledge, representing a model of harmonious human–nature coexistence in China.

Unfortunately, the onset of rural industrialization (Lin 1997) and a shift towards modern agro-industrialization in the Delta instigated the post-1990s decline of the ancient sustainable circular agricultural model. Dyke crops like mulberry and fruit trees were abandoned, and in pursuit of higher income, local communities reduced the dyke area to expand the fishpond area. Traditional green cyclic agriculture transitioned into single, high-density aquaculture. Traditional herbivorous fish species in the ponds, known as the Four Major Domestic Fish (carp, grass carp, silver carp, and bighead carp), were replaced with exotic carnivorous species like the Californian bass. High-density farming requires extensive antibiotics, fish medicine, and compound feed, leading to frequent water changes and significant aquaculture tailwater generation. This agricultural wastewater, produced by large-scale aquaculture in cities like Foshan, contaminates local rivers, posing a severe threat to local environmental quality. More worryingly, fish medicine, antibiotics, and industrial waste, including heavy metals, enter the fish metabolism, transforming them into cyborgs. Many aquaculturists reported that high-density farmed fish taste distinctly worse than fish from previous eras, and the widespread use of artificial medicines and feed has led them to avoid partaking of the fish they personally cultivate (Multiple interviews with local aquaculturists in Foshan, 2022–23). As humans consume these fish, these chemical elements remain in their bodies at least semi-permanently and affect their bodies' functioning. In this way, the human body becomes a cyborg, indicating our transition into a cyborg society (Haraway 1985) constituted by agricultural waste. The Delta is a major freshwater fish farming base in China, with its aquatic products distributed nationally and globally. As global commodity and food chains expand, environmental health issues and debates become increasingly complex to trace across spatial and

temporal scales. While countries monitor aquatic product imports, food supervision standards vary, and many harmful substances are hard to detect. Furthermore, as an environmental official in Dongguan expressed:

Compliance with standards does not equate to being harmless to health. Discussing toxicity without considering dosage is meaningless. It depends on the accumulation of harmful substances in your body over years. (Interview 2022)

The preceding examination of the metamorphosis of industrial and agricultural wastescapes within the in the Delta underscores that EJ scenarios are not necessarily confined to intense, dramatic upheavals at specific temporal-spatial junctures. More frequently, waste, in an unobtrusive manner, permeates even globally, surreptitiously assimilated throughout the annals of history. When disease outbreaks occur, it becomes exceedingly challenging to apportion responsibility and hold erstwhile polluters accountable. The state apparatus, environmental engineering, and medical scientists appear conspicuously impotent in establishing causative correlations between individuals' illness and a polluted workshop they inhabited years prior or with specific aquatic products they ingested in the distant past. This slow and insidious violence, coupled with the prevalent social inaction towards it, urges event-focused EJ to reconsider the temporalities of toxic matters.

Conclusion

This chapter critiques event-focused EJ studies that may result in social inaction towards the slow violence of cumulative environmental harms at structural or ecological levels. It conducts a temporal analysis of industrial and agricultural wastescape production in China's Pearl River Delta region, shaped by the intricate interplay of multi-scalar politico-economic forces and power dynamics. Environmental injustices inscribed in the Pearl River Delta's wastescapes are not typically discrete, isolated events or projects but cumulative, structural, and systemic detriments that insidiously accrue over extended durations. Despite the state's recent environmental restoration efforts, the persistent legacy of rural industrialization, newly emerged toxic agricultural wastescapes, and their ensuing environmental and health effects continue to experience an extended latent period for impacted groups.

In dissecting the conceded or tacit harm inflicted upon vulnerable communities through temporal political-ecological analysis, this chapter highlights

the profound challenge in assigning responsibility for the *longue durée* environmental degradation and accompanying health consequences, given the prominent temporal ambiguity surrounding disease aetiology and the considerable spatial mobility of polluting industries and affected populations. Scholars frequently assert that the dramatic surge in indigenous resource rebellions globally during the peak of neoliberalism primarily originates from a temporal perspective divergence between short-termers, who arrive to exploit, devastate, and leave, and long-term inhabitants who must bear the ecological repercussions and hence evaluate wealth differently on a temporal scale (Nixon 2011). However, adding complexity to this EJ discourse is the reality that indigenous communities and rural migrants often cooperate with short-termism in depleting local environmental assets. Individuals actively participate and contribute to the politico-economic transformation jointly orchestrated by the government and transnational firms, as demonstrated by the creation of village-based industrial wastescapes in the Delta, grassroots reforms of Rural Shareholding Economic Cooperatives, and local communities' reliance on rental economies. In this way, affected communities, acting on the event level of temporality, concede to short-termism by tolerating and acquiescing to environmental degradation for wealth accumulation. They perceive this as an unavoidable cost of development, a response to the exigencies of their circumstances. This assertion should not be misconstrued as attributing culpability to local communities. Rather, it underscores the complex predicament where external pressures and enticements compel them to balance risks in ways they would not otherwise do. Yet, the issue of intergenerational justice is at stake when communities accept certain environmental risks or harms to enhance the present generation's livelihood and well-being, potentially at the expense of future generations. Moreover, internal heterogeneity within local communities becomes apparent when some residents initiate protests against the pollution-generating workshops established by other entrepreneurial members of the community. This further complicates the dynamics and nuances of the EJ discourse.

Davies (2018) advocates for slow observation as a resistance strategy for marginalized communities, yet the decades of conceded harm elicited by the unregulated production wastescapes in the Pearl River Delta appear to challenge this optimistic outlook. It is crucial to understand that the high-risk acceptance demonstrated by indigenous communities and rural migrant workers is less a preference and more a stark necessity in the face of immediate survival needs. The high uncertainty of environmental and health hazards over extended timescales forces these communities into a difficult position, where they must prioritize immediate livelihood enhancement over

long-term health considerations. This occurs despite their slow observation of the detrimental effects of industrial wastescapes. Despite recognizing the pervasive presence of waste pollution, local communities choose to wager on their physical health for immediate livelihood enhancement, similar to what Lora-Wainwright (2021) observed in other toxic places in China. In such a context, ensuring present-day sustenance often outweighs concerns for future generations' health, thus underscoring the harsh realities these communities face. Similarly, rural migrant workers from disparate regions of China, migrate to the Delta to pursue employment opportunities. On the surface, these individuals appear to engage in an active decision-making process. They vote with their feet, departing from their homes to seek employment opportunities in the economically advanced Pearl River Delta, aiming to augment the welfare of their distant rural families. Yet, beneath this apparent autonomy, they represent the most vulnerable demographic, routinely exposed to the most toxic industrial waste in their daily labour. Owing to China's institutional exclusion of migrant workers, this demographic is spatially nomadic, officially designated as a floating population (*liudong renkou*). Charting the long-term harm of industrial wastescapes to these vulnerable groups presents a formidable challenge, thus forming a significant hurdle for future equitable environmental agendas.

Counterintuitively, this inquiry also exposes the toxic modern agricultural wastescapes. Traditional vernacular agricultural landscapes, for example, the ancient Mulberry-Dyke-Fish-Pond System in the Delta, which often exemplify enduring sustainable human–environmental relations, are now endangered by modern intensive farming driven by prevailing neoliberal market ideologies. Contemporary agricultural wastescapes, engendered by industrialized farming practices, pose risks to human health by infusing toxic substances into the food system and, subsequently, human bodies. This form of agricultural wastescape has contributed to the emergence of a cyborg society by obfuscating the boundaries between humans, waste, and the environment through food chains. In an era marked by increasingly globalized food systems, the temporal-spatial extents of health risks have significantly broadened and diffused. The geographical reach of these risks now extends far beyond local communities, subtly and indirectly impacting distant actors and communities, which makes the temporal track of victims extremely challenging. The protracted temporal scales of disease outbreaks, coupled with this spatial diffusion, resulted in high uncertainty that hinders efforts to precisely identify or locate those affected by these fluid agricultural wastescapes. The complex interplay between these temporal and spatial dimensions underscores the necessity for a more sophisticated

understanding of the dissemination of environmental hazards and their temporal experience.

Overall, the integration of detailed temporal analysis of political-economic transitions that (re)produce industrial wastescapes augments our understanding of EJ issues by unveiling their deeply entrenched, structural nature. The *longue durée* perspective is indispensable for accurately comprehending how latent and less perceptible structural or ecological changes affect injustices, vulnerabilities, and conflicts.

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Waste and the Historical Future

Zachary Riebeling

Introduction

In director Kevin *Waterworld's* flawed 1995 post-apocalyptic action blockbuster *Waterworld*, ice caps have melted, civilization has collapsed, and humans cling to small floating atolls or ravage the seas in bandit outfits, sharing hopeful tales of the existence of dry land. The mutated, amphibious protagonist, named only as the Mariner and played by Kevin Costner, scavenges and salvages across a future Earth covered by a single planetary ocean. After taking in a child who carries a map to dry land as a tattoo and the woman who is her guardian, the Mariner is hailed by a trader who wishes to exchange goods for time spent alone with the passengers. Although initially dismissive, his interest is piqued when the trader presents a precious item kept close in a sealed container: paper, a page from what originally was an in-flight magazine or safety pamphlet, scrawled over with generations of markings from successive owners. Rather than an artifact of present-day travel tedium, in a world covered by water a page authored for airline customers is now valued as a priceless antiquity.

Far away from *Waterworld's* imagined future, outside of Carlsbad, New Mexico, stands the United States Department of Energy's Waste Isolation Pilot Plant (WIPP). Located over 650 meters beneath the earth, the site is designed to contain transuranic waste for 10,000 years ([Department of Energy 2003](#)). In the attempt to 'warn and inform future generations and civilizations about the location and purpose' of the WIPP, the Department of Energy developed a symbolic architecture designed to communicate danger into a future that will have forgotten the present. Features include a perimeter of granite monuments inscribed with symbols and messages in various languages, a monumental 'information centre' likewise engraved, and a massive earthen berm containing buried metals that will provide a unique and intelligibly non-natural radar signature.

These two texts—one from fiction and one from an all-too-real reality—compel us to consider the historical future alongside waste, as the ever-proliferating amounts of detritus humans throw away cast their shadow over not only our landscapes, cityscapes, and dwelling places, but also, following Boris Shoshitaishvili, our ‘timescapes’, the broadly shared assumptions about temporality that undergird our cultures (Shoshitaishvili 2020). The Mariner roams a global ocean in which everyday twentieth-century waste has become priceless, shrouded in mystery and totemic of a lost world of riches and plenty. Transuranic waste lies buried beneath the New Mexico desert, where a complex will be built above it to warn future subjects whom we can only imagine on a timeline that is beyond any human experience. Scholars of waste have long considered the long-term after-effects of contemporary production, consumption, and discarding (Hird 2016; Liboiron and Lepawsky 2022). In a parallel development, a concern with temporality and the historical future—the futures that are projected/predicted/anticipated by historical consciousness—has recently surged among theorists and philosophers of history. The inspiration for this chapter is the productive possibility of bringing these two streams of scholarship closer together, in order to imagine what waste has done and is doing to conceptions of historical time.

Focusing primarily on non-biodegradable detritus such as plastics, metals, and chemicals, it argues that wasting as an act is an expression of a deep anxiety about a temporality that outstrips and is alien to our familiar human reckonings of lifespans and generations. The centring of non-biodegradable waste here is directly tied to chemical temporality: a pumpkin can be seen rotting over the course of a week or two, chartable by a human observer, while a plastic milk carton will seem to be unchanging over decades. As consumers, historical subjects, and, ironically, as recyclers, our discarding of non-biodegradable waste is in part a reaction to the temporality embodied by that waste. This temporality far outstrips our lifespans and threatens us with a foreboding sense of consequence. This sense of consequence, the realization that everyday wasting of plastics and other materials will have impacts far beyond our own lifespans, is inimical to the regimes of convenience and disposability that help make waste ubiquitous. This anxiety is not necessarily conscious but is expressed in the desires and practices that make waste something to be kept away. That is to say, part of what makes plastics (and other non-degradable materials) disposable is precisely the range of characteristics which outlast us and puncture our temporalities, and which disrupt the projection of a sovereign, agentive historical self that consumption and wasting conjure. Our difficulty in imagining, in politically or economically effective ways, the temporal scale of the effects of wasting cause the material

artifacts of our non-degradable refuse—plastics, chemicals, toxins, and so on—to become tokens of unease. Pieces of waste, in this theorization, are in part artifacts of the future, comprised of material we know will outlast us into a future that we shy away from comprehending.

In support of these claims, this chapter begins by placing them in the context of the scholarly literatures of waste and historical theory. Then, drawing on the thought of Georges Bataille, it will argue for an understanding of waste as an act of sovereignty, a conjuring of power, freedom, and fulfilment. Finally, it will attempt to demonstrate how understanding non-degradable waste products as artefacts of the future can help us formulate a critique of historical time and historical subjectivity.

Whose Anthropos? Which -cene?

There is a danger in the first-person plural as I employ it throughout this chapter. The occurrence of waste-as-act and the production of waste-as-object are not uniformly distributed across human geographies, but are stratified by relations of oppression, extraction, and immiseration. Here a crucial intervention by Kathryn Yusoff warning against the social flattening of the Anthropocene is salient (Yusoff 2016). Critiquing the formulation of ‘a mythic Anthropos as geologic world-maker/destroyer of worlds’, Yusoff surfaces the question of the unity of the subject ‘Anthopos’ that now wields geologic agency (Yusoff 2016, 5–6). In projecting future discoverers who must make sense of human activity in the Anthropocene by studying traces in the geological record, theory has created a problematic that compels the consideration of ‘how humanity is deployed as a method of erasure that obfuscates climate racism, social injustice in fossil fuels, and differentiated histories of responsibilities through homogenization in a “we” of the Anthropocene’ (Yusoff 2016, 7).

Putting waste and historicity together can thus help further recent theoretical refinements of the Anthropocene frame. Among divergent variations, one of the most poignant for thinking about waste is the ‘Capitalocene’, first formulated by Andreas Malm and expanded and defended by Jason W. Moore (Moore 2016). Critiquing the Anthropocene as a product of ‘green arithmetic’ that rests on a dualism between the natural and the social, Moore offers ‘Capitalocene’ as a means of capturing the historical roots of ecological crisis in capitalism as a system of organizing nature, a ‘world-ecology’ (4–6). Thinking with this critique, our subject who constitutes itself through wasting is not an innate human type, but a construct that coheres through the

interaction of multiple processes of exploitation—of labour, of environment, of knowledge. This allows for a clearer view of the connection between the consumer-subject and Bataille's violent sovereignty.

Of all the recent '-cenes', however, the most important for our topic is Marco Armiero and Massimo De Angelis's concept of the 'Wasteocene' (Armiero and De Angelis 2017). In drawing out the Wasteocene framework, Armiero describes waste as 'the essence of the Anthropocene' and the Wasteocene as a lens that reveals waste as a set of 'socio-ecological' relations that determine what, where, and whom are wasted (Armiero 2021, 10). This shift from matter to relationships provides a powerful corrective to the temptation to reify, to treat the material embodiments of the Anthropocene as purely technical challenges and obscure the historicity of the social relations which produced them in the first place (11). This is important for our study of waste and the historical future, as it reminds us that historical consciousness too is born out of social relations and will bear their marks, as we examine further below.

Waste, Time, and the Wasting Subject

In his foundational study *On Garbage*, John Scanlan theorizes waste in two valences: first as a 'remainder' that, through its accumulation and perforation of otherwise orderly life, reveals an imbalance in the world; second as profligacy, as the failure to maximize the utility of resources, gifts, opportunities, and so on (Scanlan 2005, 22). In both senses, Scanlan continues, waste is grounded in a 'moral economy' that works to regulate anxieties about ends and consequences, about the unknown that comes after us. Waste, like other cognate categories of garbage, connects us uncannily to an 'indeterminateness', a sense of the chaos of the natural beyond human ordering (25). Waste seeps through our barriers design to contain and channel it; it is out of our control. Under moral regimes that generate waste, then, the presence of waste generates anxiety in individuals and collectives, as it embodies the limits of human attempts to master the world.

Scanlan connects the anxiety surrounding the indeterminateness of waste to time explicitly. Time reminds us, stands as proof to us, that we ourselves 'do not escape these universal processes of generation and decay', therefore rendering moral-economic attempts to regulate, in the end, futile (Scanlan 2005, 33). So, waste stands before us as a chimera, haunting the present as a remainder of our attempts to order the world and as a reminder of the inevitability of our deterioration. Scanlan states powerfully:

Deteriorating matter ... embodies a time that exists beyond our rational time: in this shadow world, time is always running matter down, breaking things into pieces, or removing the sheen of a glossy surface and, therefore, the principal methods of dealing with material waste ... are simply ways of ensuring that this fact does not intrude too far into everyday experience. (Scalan 2005, 34)

Garbage and waste haunt us temporally; time is the category from which they emerge as problems.

While waste-as-object reminds us of the limits of our agency within the world, waste-as-act works to obscure the anxiety produced by our refuse. The removal of waste from our presence defends against the impositions that waste makes on the self-understanding of capitalist subjects. Gay Hawkins convincingly argues that regimes of convenience have fashioned a new self, one designed to be impervious to the ethical ripples spreading out from waste:

For the kind of self imagined in this rubbish practice ... is not simply alienated from production, it is a self who regards rubbish as ethically insignificant, a self for whom 'waste' has few moral connotations. (Hawkins 2001, 10)

The fate of serially-disposable waste is not the responsibility of my consumer-self; that is the domain of technocracy, of 'rational technologies of removal' (Hawkins 2001, 10). Waste thus becomes a technical problem open to technical solutions administered by experts and specialists, removing the concern from the consumer. This expertise, conglomerated into waste management firms, regulators, recycling interests, salvage economies, both soothes and absolves the consumer by removing waste and promising its transformation—into energy, material, or inert harmless matter.

This separation of waste from the wasting subject effected by waste management is far from impermeable, however. Interaction with waste can be an incubator of 'ethical subjectivity', in which consumers develop habits of wasting that align with moral economies of sustainability (Lehtokunnas et al. 2020). On the one hand, this would present the possibility of a potential harmonization of the relationship between waste and subject. On the other hand, it can demonstrate the precarity of the subjectivity that wasting creates. Hawkins, interpreting a letter to the editor complaining about the burdens of sorting recycling, shows how the diffusing of responsibility for dealing with waste disrupts the consumer-self. If the self is defined by what is excluded from it, that is, by disposal, then the requirement to work upon my waste after I have wasted it is 'a primordial threat to the drive for

wholeness' (Lehtokunnas et al. 2020, 15). For the consumer subject, the self is sustained through the delineation of value and non-value; that which has value is retained, that which does not is discarded. If that which I discard in the pursuit of defining my subjectivity returns, if it lingers in my presence like a spirit I had thought exorcised, then the self becomes unstable, dissolving at its edges, agency disintegrated before the unconquerability of nature. Hawkins calls this mirage of wholeness a 'fantasy', and crucially for our purposes here, links it with a fantasy of sovereignty. The self who wastes without concern, for whom what is discarded ceases to matter after its expulsion, and, crucially, its removal from the senses, is also a projected sovereign, in control of the self, the body, and the orderly distinctions that separate filth from propriety, chaos from order.

Temporality in Contemporary Historical Theory

Theories of historical time have developed recently in such a way that makes admixture with waste scholarship not only promising but also necessary. François Hartog's work has been eminent. Writing about the presentism that was dominant since the 1970s, he argues that 'the present, considered as an instant, contracts almost to nothingness, yet paradoxically it never ceases to expand, both into the past and into the future, becoming a sort of perpetual present' (Hartog 2022, 194). However, this empire of the present—marked by the desire for instantaneity, in commerce, entertainment, labour, and other spheres of life—has begun to perforate under the advance of the future, in the form of the Anthropocene, the epoch that marks the attainment of geological agency by human beings. Here, timespans ranging into the billions of years are placed behind everyday human existence, leading us to be pulled at once into miniscule ranges of time—digital developments, instant communication—and massive geological and cosmological ranges (Hartog 2022, 212). At work here is what Boris Shoshitaishvili has identified as a twofold transformation in which time scales expand while the pace of technological and environmental change accelerates (Shoshitaishvili 2020, 126). Hartog stresses the novelty of Anthropocene temporality, which has done to the future what Buffon and Darwin helped do to the past, namely shatter anthropocentric illusions by placing the timescales of human life and history in relief against the immensity of natural time. Referring to the natural historian Georges-Louis Leclerc, Comte de Buffon's propagation of the idea that the Earth was much older than scripture-based reckonings would allow, he writes 'from Buffon's limited abyss we have shifted to a general abyss that

lies behind us, before us, beyond us' (Hartog 2022, 214). The 'limited abyss' here is the loss of familiar grounding in the past, where the geological and astronomical histories of the planet shrink anthropocentric reckonings into minuteness. We may add, riffing on Hartog and Shoshitaishvili, that Pascal's spatial dread—'the eternal silence of these infinite spaces frightens me'—has become our temporal terror, and our movement towards that terror is ever accelerating, to the extent that catastrophe, apocalypse, and eschatology increasingly colour cultural artifacts and have transformed, as Hartog notes, in order to account for a final catastrophe, the sixth mass extinction (Pascal 2003, 61; Hartog 2022, 210).

Part of this dread arises from the disappearance of—or at least, the waning of our belief in—our ability to anticipate, predict, and understand the future. Reinhart Koselleck, one of the most influential historians of the twentieth century a premier scholar of the conceptual history of modernity, famously described the increasing gap between experience and expectation, between what I know the world to have been and what I expect it will be in the future (Koselleck 2004). From utopian political imaginings and progressive philosophies of history to flying cars and interplanetary colonization, myriad examples could be summoned to demonstrate this gap. However, with the emergence of the Anthropocene and the immense scholarly effort that has been dedicated to making sense of it, the experience/expectation binary is dissolving. Zoltán Boldiszár Simon and Marek Tamm argue in their recent primer on historical time that our understanding of it must account for the 'collapse of the distinction between natural time and historical time upon which Koselleck's investigations have been based'—meaning, the multiple temporalities of human time which fascinated Koselleck can no longer be separated from the *longue durée* of the natural world (Braudel 1995; Simon and Tamm 2023, 7). Following Dipesh Chakrabarty, they argue for a recognition of the merging of human and natural history that the epoch/concept of the Anthropocene effects. Adopting the metaphor of a 'fabric' of time from physical sciences, Simon and Tamm chart a jumbled tapestry of 'multiple temporalities and historicities' in the attempt to map the plurality of often-conflicting times upon the single fabric of historical time in general, so that singular conceptions of the past or the future do not cloud our vision (Simon and Tamm 2023, 53).

Armiero's Wasteocene proves its relevance at this point in our analysis. For the progress-oriented historical consciousness that is passing away in late-modernity is also a product of these same social relations that produce the Wasteocene. The afterlives of progress in historical consciousness can thus be thought to draw their stubbornness from the continuance of these

social relations which are structured on the logic of wasting, the separation of the wealthy from the poor, the clean from the dirty, the worthy from the unworthy. The future may be an abyss, but some have finer arks than others.

With the collapse of the distinction between human and natural time inaugurated by the Anthropocene, however, the senses in which one plans, predicts, or prophesizes the future have not been rewedded to experience. Simon has argued elsewhere that contemporary conceptions of the future are dominated by the figure of the ‘unprecedented’ (Simon 2019). Where once the Western world could conceive of the future as part of a process linking past and present in continuity thereby familiarizing it, its historical consciousness in the twenty-first century is characterized by a temporal disunity (Simon 2019, vii–xiii). The catalyst for this separation is the unprecedented, those future events which lurk just over future horizons like shadows behind a curtain and which portend fundamental transformations of human existence—for example, the singularity, in which technological growth achieves an escape velocity of sorts and becomes self-moving, or climate catastrophe, in which the ecological conditions of our planet have deteriorated past the point of no return. For Simon, this situation has made it impossible to conceive of an ontologically stable and continuous subject of history (Simon 2019, 54). No longer can we project a historical subject into the future (or into the past for that matter), no longer can we assume that the future modes of historical consciousness that will emerge will belong to a subjectivity identical to ours. Indeed, when considering the unprecedented it is no longer appropriate to speak of a ‘we’, since there is no shared subjectivity between present and future subjects. Here, the administrators, engineers, and scientists in the US Department of Energy prove to be on the cutting edge of historical theory, wrestling with the problem of how to ward an unknowable future subject against the toxic remnants of our passing historicity.

From Waste to History and Back Again

From this work of reading scholars of waste and scholars of historical temporality alongside on another we can build a theoretical *mélange* that brings waste and historical theory into focus together. From Hartog, we take that the future is an abyss, into which we are hurtling and in which catastrophe looms as a terminus. From Koselleck, we take that the future has become unmoored from experience, splayed into a plurality of possibilities that defy harmonization. From Simon, we take that the historical future is now the domain of the unprecedented, and that whatever historical subject witnesses

and works upon its arrival, they will be alien to our contemporary historical consciousness. From Scanlan, we take that waste haunts us as a reminder of the universality of decay, a spectral presence that represents both our attempts to overcome the chaos of the natural and the inevitability of the failure of these attempts, the victory of time over our regimes of ordering. And from Hawkins, we take that waste is central to the formulation of a certain self, the consumer-subject bounded only by convenience, a sovereign for whom the presence of waste-as-object after completion of waste-as-act is a moment of disruption, instability, and rebellion. Within this *mélange* the connection between waste and historical temporality becomes clear: non-biodegradable waste has become the material presence of Anthropocene time.

Sovereignty, Subjectivity, and the Imposition of the Future through Waste

We began this chapter with a focus on the consequences of considering non-degradable waste side-by-side with theories of historical temporality. The act of wasting these materials—in at least the cases of the consumer-subject outlined by Hawkins and in the disposal of transuranic waste projected by the WIPP—is an act of conjuring a sovereignty that can order the world and hold back the abyss of the future and the unknowable alien subjectivity that it heralds. It is a spell against catastrophe, against the dissolution of the coherent, ordered, liberated self who consumes freely and discards with abandon. Single-use plastics, nuclear contaminated articles, and the like are artifacts from the future, devalued objects whose immediate utility has passed—has been emptied out in the act of use/consumption—yet nevertheless haunt us with the temporality they materialize, a temporality in which the human is altered beyond comprehension and/or unmoored from the centre of the future. Waste-as-act conjures sovereignty, waste-as-object sweeps it away.

In order to understand more clearly, then, the new forms that waste is imposing on temporality under the Anthropocene, we must undertake a brief exploration of sovereignty. Our guide here will be the twentieth-century French thinker Georges Bataille, specifically his *The Accursed Share*, a three-volume work which explored the role of expenditure in political economy, culture, and politics. Bataille's suturing of waste and sovereignty forms the core of his importance for our investigations. To employ Bataille for understanding historical temporality, it is first necessary to recognize the heretical nature of his intervention into economics, inspired as it was as much by the human sciences—anthropology, sociology, theology—as

by classical economic models. Bataille offers a transvaluation in which the wasteful, rather than being a loss of potential or efficiency, produces and sustains human culture. Bataille argues that expenditure is at the core of human life, both in the biological register—living matter as a principle generates surplus that must be expended without profit or, in other words, wasted—and in myriad cultural forms and political mythologies (Bataille 1991a, 27). When the limits of growth have been reached, the excess must be wasted, and for him both history and the contemporary world are rich with examples of rituals the purpose of which is to work upon a primordial self-alienation (the loss of the origin, division between subject/object and self/world). These rituals, such as potlatch, human sacrifice, or royal finery, function to link waste with power and freedom, and thus with sovereignty (Bataille 1991a, 131–40).

‘Sovereignty’ is the title of the third volume of *The Accursed Share* and contains Bataille’s extended examination of the connection between expenditure and authority, on the one hand, and the limit experiences in which human subjectivity is made vulnerable, on the other. In an alternative to Carl Schmitt’s famous grounding of sovereignty in exception, Bataille finds its roots in waste (Schmitt 2006). The sovereign is first and foremost distinguished from the base and servile, and crucially, the practical. The sovereign is unlimited by practicality, unencumbered by the strictures of utility, free in the realms of excess and pleasure (Bataille 1991b, 198–9). Toil is left to the peasant and the labourer, the artisan, and the trader; the consumption of wealth in excess is the concern of the sovereign. From Versailles to Kyoto to the Vatican, we can even begrudgingly find examples of Bataille’s formula. The erotics of wasting come to the fore here for Bataille, as pleasure is the pleasure of the moment, in which the present overtakes the subject’s temporal horizon and obscures the future, which in Bataille’s theory is the domain of work, servility, planning, and rationalization. Further, Bataille understands sovereign pleasure to be realized only through exploitation of the labour of the non-sovereign, those whose work is bound to utility and for whom the sovereign takes on the role of the focus of expenditure.

This sovereignty that Bataille’s work describes is far from stable, however. On the contrary, as Benjamin Noys has shown, Bataille’s sovereignty does not produce a subject beyond necessity; rather, due to its inexorable link with violence, it is that subject’s annihilation (Noys 2000, 73–5). If the sovereign is both free from utility, and that freedom comes in extreme experiences that totalize the present and feature the suspension of subjectivity, then sovereignty is pulled between the poles of a fully realized subjectivity and that realization’s simultaneous negation. Sovereignty dissolves on one hand in impositions of utility, and on the other in the ego-effacing experiences of

sex and death. Sovereign expenditure destroys the very subjectivity it would create. Sovereignty is therefore entwined with violence, both in material regimes and acts of violence that enforce claims of sovereignty and in the limit experiences that make thinkable pure expenditure beyond necessity.

The Vanishing Sovereignty of the Wasting Subject

Here Bataille harmonizes with our theoretical *mélange* drawn from waste studies and historical theory, in which waste is imbricated in anxieties about the future and in the project to constitute a sovereign self. If we return to Hawkins's consumer perturbed by the lingering presence of waste and the social-legal-moral compulsion to work upon it, we can see Bataille more clearly. To waste something is to claim the power to live without it, to be free from any necessity it imposes. Freedom from necessity, the freedom to expend in excess in states of ecstasy, is the mark of sovereignty. If expenditure addresses a primordial separation from the whole (Bataille), and waste threatens the desire for a reconstituted wholeness (Hawkins), then waste-as-act is an attempt to conjure sovereignty, to occlude the future in order to savour the erotics of the now. Furthermore, this erotics is constituted through violence (Noys), allowing us to see the links between the subject-making effect of wasting and the material inequalities of our world that waste brings into view. The sovereign consumer-subject is constituted as such through exploitation of the utility of an other—in the factory, the field, the mine, the service sector, and so on. If the dominant historical consciousness in our contemporary moment manifests a foreboding of catastrophe (Hartog) and the prescience of the passing away of present historical subjectivity (Simon), then the sovereignty conjured by waste-as-act is threatened by, or in tension with, the temporality that waste-as-object materializes: the temporality of the Anthropocene, the temporality of millions of years and unchartable consequences, of ultimately fruitless violence.

Conclusion

Here I must indulge the speculative desire to offer an attempt at a summation of the above arguments and a graphing of how these various trajectories intersect to force waste and the historical future into the same plane. Waste-as-act conjures a shield against the impositions of waste-as-object. The throwing

away of a single-use plastic or the burying of tons of transuranic waste—or, to follow Hawkins's reflection, the refusal to sort recycling—is the expulsion of the temporality embodied in those very objects. It is the temporality of these things that makes discarding them an act of sovereign will. And the futility of this defence, its recurrent reenactment in wasting, only heightens its repetition and the compulsion to conjure a sovereign subject by defying the limits of utility, that is, by wasting. It is by casting these totems of sovereignty away that we return them to the abyssal time of the Anthropocene and by doing so quicken the advent of the catastrophe it heralds. Thus, we can read non-degradable waste objects as artefacts of the future, and these acts of wasting as the desire to banish them to their proper temporality, the temporality that swallows the human as it is.

Waste then is a practice and a material form through which we work upon the Anthropocene, through which we attempt to repel and yet call closer the historical future. By casting away my water bottles and cellophane wrappers, I banish the uncanniness they materialize as synthetics the rate of deterioration of which is exponentially slower than my own. They will outlast me, and by discarding them I attempt to dispel the abyssal historical future that they herald. At the same time, by repeating this ritual of expenditure, I hasten the arrival of that future through uninterrupted despoilation and unchecked consumptive desire. By discarding them I lurch into sovereignty, constituting myself as a subject of pure expenditure, and in this very process dissolve the subjectivity that expenditure projects. The project is incomplete, and thus repeated.

Waste is a mode of interacting with future historical temporalities and subjects, and the historical future is a lens to understand the complexities of waste as both object and practice. Seeing waste as sovereignty and waste articles as artifacts from the future gives us critical perspective on human agency and human history under the Anthropocene. One of the core practices that gives us the feeling/illusion of being agents of history—waste—is at the same time the dreadful reminder of our ephemerality: short experience, long effect, and the abyss between them that unsettles.

From these claims, we can gather some of the value of waste as a necessary critical constellation—material, cultural, textual, chemical, economic, political—for understanding ideas about the historical future. By reading non-biodegradable waste objects as artifacts of the future, we can see how the crises of historical meaning that have roiled historical thought since the close of the nineteenth century are intersected by everyday material practice. Waste allows us to see wasting as a philosophical-historical act, working upon the historical future that waste-as-object materializes. The problems of historical

temporality in this sense are not abstract at all, but can be touched, crumpled, compacted, burned, and piled. Hopefully the lines of thinking followed in this chapter have showed the promise, in part, of critiquing historical consciousness by thinking from and through waste.

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Wasting to Slow Down Time

The Paradox of Informational Waste

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What Is Informational Waste?

The internet can often feel like a landfill, a place swamped by a deluge of emails, spam, and unneeded data. Undoubtedly, the concept of informational waste, sometimes described as infotrash, is familiar to most people. Dealing with digital information can be unproductive and draining, as anyone who has tried downloading emails on an expensive international data plan while travelling abroad knows. ‘90% of what we do in digital is either useless waste to begin with or else quickly ends up in a data dump’, as writer [Gerry McGovern \(2020, 12\)](#) polemicizes: 90 per cent of the web is clutter and defunct code, and 90 per cent of data collected is never used or analysed. McGovern sees the digital world as inherently wasteful, consuming vast amounts of resources and energy, generating toxic electronic waste, and most importantly, promoting a wasteful mindset. In short, the problem of informational waste presents an urgency, just like physical trash. But this is where the analogies typically end: information and matter are considered opposing categories. Tech companies touting the dematerialization of the economy through immaterial, frictionless, and infinitely consider scalable digital information reinforce this dichotomy. This chapter challenges these claims by examining physical waste from an informational perspective, and informational waste from a material perspective. Invoking materiality is, of course, a familiar mode of technological critique, howsoever it emphasizes the emissions; as e-waste or as exploitative labour practices of the digital economy. The two-pronged approach of this chapter goes beyond accounting for its material impacts by exploring the finer structural connections between waste and information that operate through incorporeal aspects such as value and time.

What can we learn about informational waste from our longer experience with physical trash? Waste commonly describes anything that has lost its value and is no longer useful in a particular context. This definition implies that what is currently viewed as waste was once a valuable resource in a different time or context. ‘To waste’ as a verb makes this notion of loss explicit—the act of wasting as the unproductive use and consumption of resources such as land, materials, labour, or time. In economic terms, waste is therefore often framed as an inefficiency. With more efficient processes, resources could have been preserved and more value extracted. More than a lost opportunity, waste is a liability that incurs costs, whether in the form of mandated waste treatment or tipping fees. From the perspective of production, it therefore makes economic sense to minimize, if not completely avoid, inefficiency and waste.

However, a lens of inefficiency does not capture the realm of consumption. In current capitalist realities, wasting is not an incidental loss but, somewhat paradoxically, a deliberate mechanism for generating value. The price of oil depends on its consumption and combustion, just as the stock market price of companies such as DOW and BASF depends on the widespread waste and disposal of single-use plastic products. ‘The future of plastic is in the trash can’, as the *Future Modern Packaging* magazine editor Lloyd Stouffer famously declared in the 1950s—in order to thrive, the plastic industry had to teach consumers how to waste (cited in [Liboiron 2021](#)). Wasting as the basis of value production is a pervasive notion that includes treating human labour as an expendable resource. In disaster capitalism, a crisis is a terrible thing to waste ([Klein 2007](#)).

Given that single-use plastic waste is clearly profitable for certain industries, it is not enough to define waste solely in terms of value and utility. The concept of planned obsolescence touches on this issue but does not go far enough. The broader goal is not just to shorten the lifespan of a product to sell more of it, but rather to produce something that is waste in the first place. It appears that only the act of wasting, discarding, or disposing ultimately determines what constitutes waste. This is reflected in international agreements such as the Basel Convention ([Basel Convention 2023](#)) and entities such as the European Union. The latter defines waste as ‘any substance or object which the holder discards or intends or is required to discard’ ([European Union 2008/98/EC](#)). Discarding is, however, never a final act but rather a transition into formal and informal waste systems, expansive sociotechnical infrastructures whose size and complexity can rival every other industrial process.

In the case of informational waste, the act of deleting a dataset from a hard drive is almost inconsequential in itself. Wasting does not take place on the side of the user but on the side of the producer, who uses energy, labour, and natural resources to produce and maintain information in vast quantities that is useless from the beginning. This chapter examines the logic of *wasting to generate value* in the digital economy, which depends, as I will argue, on constant infotrash production. To this end, I apply a critical approach that does not limit itself to an account of the harmful and neglected material impacts of digital technology but more broadly considers the production of informational waste as a material practice that plays a variety of roles in digital capitalism.

Waste as a Material

Physical waste is matter that needs to be dealt with. Waste has material agency through its visceral nature, it presents itself as some kind of problem. As historians of infrastructure such as Martin Melosi have pointed out, what kind of problem depends on perspective and worldview: For a public health department, waste is a public health issue; for a homeowner association, it is an aesthetic nuisance; for engineers, it is a logistic problem; for environmental justice advocates, harm and injustice (Melosi 2004). Each of these perspectives not only suggests different ways of dealing with waste but also conceptualizes the concept in different terms and categories.

Despite its tangible presence, waste is therefore ontologically not stable. As it undergoes physical separation and chemical transformations, trash changes its labels and categories. Marjory the Trash Heap, the omniscient character in Jim Henson's *Fraggle Rock* (1983–87), receives its infinite wisdom from being *everything*, speaks in varying accents and occasionally changes its gender. Initially, discarding is an act of disqualification—throwing something away erases its individual properties; it becomes part of a fluid, undifferentiated mass (Pardo 2006). But once materials enter the managed waste stream, new taxonomies apply; waste is differentiated and sorted by physical properties or internal composition. The labels of waste and its associated notions of value depend on location and context, the policies and waste management systems in place.

The informational dimension of waste is inseparable from its material qualities. Reflecting different worldviews and problem definitions, frameworks and taxonomies of waste are necessarily incomplete; their metrics of

quantification inevitably emphasize some aspects while leaving others out. The practice of collecting waste data offers many examples in this regard. For a long time, the bulk volume and tonnage of waste generation have been the main metric used by cities. Volume has also dominated public imagination, comparing waste production to the pyramids or considering the visibility of New York's former Fresh Kills Landfill from outer space. Only recently, the diffuse smog of microplastic pollution has entered the public consciousness. Its relevant characteristic is no longer its volume or density but its pervasive presence across the atmosphere, oceans, and living organisms. For the endocrine-disrupting effects of many plastic components, the dose and the amount of exposure are no longer relevant, only their presence (Liboiron 2016). The many problems of plastic recycling have been discussed for some time (MacBride 2012), but its role as a source of microplastic pollution has only recently received attention (Stapleton et al. 2023). It may take decades before a harmful impact manifests itself and decades for a regulatory response to be put into action. Assessments of waste impacts depend on the questions being asked, which evolve with scientific and political discourse.

Waste as Information

I have previously called attention to various connections between waste and information (Offenhuber 2017b). In the following discussion of infotrash, two aspects will be particularly relevant: First, the explicit labels and value attributions of waste that incompletely represent its material agencies; and second, hidden material information that is present but not recognized.

Explicit Information

Waste management both requires and generates a significant amount of structured data. However, due to the fragmented nature of waste systems, relevant data are rarely shared across participants in the waste system and remain confined to administrative and organizational boundaries. Municipalities and counties typically use their own systems, which have varying degrees of sophistication. As Scheinberg et al. note, the quality of waste data can be used as a proxy for the overall quality of the corresponding waste system, while the quality of waste management services tends to indicate the overall quality of local governance (Scheinberg et al. 2010, 206). It has often been criticized that municipalities measure their recycling systems only through diversion rates, the proportion of recyclable materials diverted from

the waste stream, but rarely track how much of that material has actually been recycled or the amount of emissions avoided (MacBride 2012; Zaman and Ahsan 2019; Pollans 2021).

The effort spent on gathering waste data tends to mirror the perceived worth of the waste itself, whether that value is positive or negative. Recycling companies are particularly interested in the amount of metals found in curbside recycling: aluminium, steel, and copper are not only high-value secondary raw materials but are also not difficult to recycle. Likewise, materials with a negative value need to be closely observed: materials designated as toxic or hazardous that require costly treatment and, therefore, require monitoring and tracking. Neoclassical economics explicitly ties the concept of value to information, treating market price as an informational signal and a key indicator of value. The extreme reductiveness of this concept makes it flexible and widely applicable, but it comes at the cost of ignoring environmental and social consequences.

Latent Information

While the act of wasting reduces individual objects into an undifferentiated mass, waste still bears the traces of its history; a material witness that testifies to past events and processes (Schuppli 2020). It is not a coincidence that waste plays an important role in forensic investigations. Gonzo journalist and self-described *garbologist* A. J. Weberman understood this when he kept stealing trash bags from Bob Dylan's townhouse in Greenwich Village, seeking evidence that would support his various conspiracy theories about the musician (Weberman 1980). Another garbologist, Bill Rathje, excavated landfills in Arizona to study the behaviours of consumer society. As an archaeologist, he knew that the refuse people leave behind often reveals more about their behaviour than surveys and interviews (Rathje and Murphy 2001). Rathje found, for example, that people generally overestimate their recycling behaviour and understate their alcohol consumption. As a physical trace of human activity, waste is material information. For Rathje, it is a reliable source because it is incidental. But while explicit labels are intended to capture a single aspect, material traces capture a wide range of events—they have *autographic* or self-inscriptive qualities (Offenhuber 2023).

The latent and explicit informational aspects of waste are closely interconnected. The act of disposal involves erasing explicit information but, at the same time, generates a physical trace that includes not only the discarded object but also the imprints of its place, use, and context. Furthermore, both forms of information stand for two distinct methods of examining waste.

Creating labels and categories are modes of generalization, while the forensic perspective is concerned with individualization, ‘the idea that no two things in the physical world are ever exactly alike’ (Kirschenbaum 2008, 10). Both methods are used to renegotiate the informational aspects of waste—for example, in waste composition studies, in the international trade of waste, or in the investigations of a future garbologist.

Informational Waste

In the realm of infotrash, we can also find data that have fulfilled their original purpose and require management and disposal. Similarly, we can distinguish between explicit and latent information. Before turning to the materiality of informational waste, I will examine these two aspects in the symbolic domain: information explicitly obtained for a particular purpose and incidental information associated with the process of data collection.

Data Waste

Data have a lifecycle just like consumer products; at some point, a datum has outlived its original purpose and is no longer useful. Just like its physical counterparts, data waste can present an urgency. For once, its volume can be substantial; version control systems preserve every single datum in countless instances. Cloud storage for long-time archiving can be expensive, and obsolete data presents a risk and a liability when it falls into the wrong hands. Considering the capabilities of forensic data recovery methods, the only reliable way to destroy a dataset that has become a toxic liability is the shredder, which turns data literally into scraps of e-waste. Similar to hazardous substances, obsolete data are subject to regulations that prescribe specific treatments. To prevent organizations from unnecessarily keeping data about individuals, the European Union’s General Data Protection Regulation’s (GDPR) framework requires media companies and data controllers to remove data that is ‘inadequate, irrelevant, or no longer relevant’ (European Commission 2018).

Even before regulations such as the GDPR were in effect, most data were destroyed at the end of their lifecycle; the current practice of pervasive and obsessive data retention is a relatively recent phenomenon. According to the tech journalist Kevin Kelly, the online auctioning platform eBay did not archive expired transaction data as late as 2006, as it saw no use for this

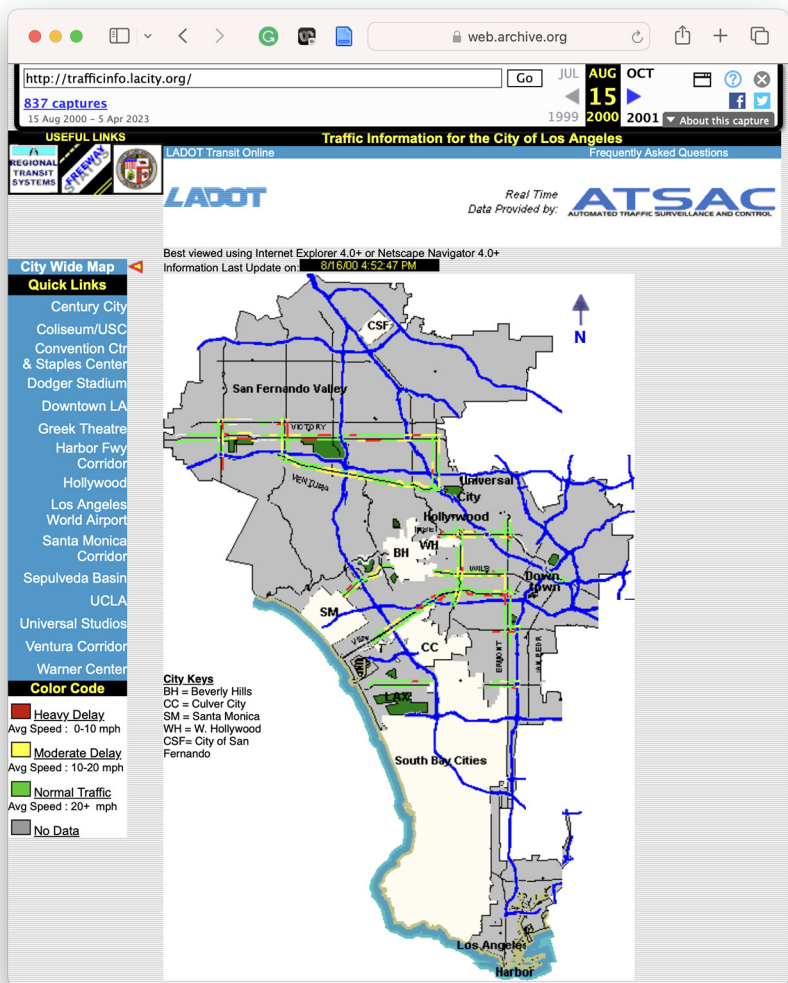


Figure 16.1 Archived screenshot of Los Angeles' live traffic info from August 2000 (Archive.org)

information.¹ The city of Los Angeles has counted traffic on major intersections using induction sensors since the mid-1980s and processed this information to control traffic lights and visualize traffic conditions in real-time (see Figure 16.1).² These data, which could have served as a fascinating

¹ In a personal conversation

² See an archived version from August 2000 at [LADOT \(2000\)](http://trafficinfo.lacity.org/).

archive to study the history of traffic in Los Angeles, were not preserved by the city. Historical transaction records and traffic sensor readings are examples of what the big data industry calls *data exhaust*—data as incidental by-products of various activities within digital infrastructures; data that are no longer useful for the immediate purpose for which they were collected.

Opportunistic Data Sources

As companies shift their revenue models from services to hoarding and monetizing data, we can observe a shift from the explicit to the forensic perspective. In examples like the early eBay, a datum fulfilled an explicit function in a process. Once that process is complete, data are no longer useful and become data exhaust. The *Big Data* hype of the early 2010s discovered data exhaust as a profitable information source. Data are no longer only used for their original purpose but instead mined for clues about users, their behaviours and intentions. This is possible because digital data can also hold latent information, even if their sparsity and rigidity are no match for the richness and complexity of physical traces. Similar to how a digital audio recording of a busy street offers many clues about events that have taken place, any large and dense enough dataset, even if it only consists of a single variable, contains the imprints of the context of data generation. The nighttime glow of cities in satellite images, originally an unintentional outcome of military surveillance programmes, is used as a proxy for measuring global economic activity (Hall 2001; Offenhuber 2017a). Search engine queries, which reflect the intentions of users and the issues affecting them, have been used to predict flu outbreaks; bad online reviews of scented candles point to the frequency of COVID-19 related loss of smell (Lazer et al. 2014; Beauchamp 2022). Similar to the information recovered from Rathje's landfill excavations, such unconventional data sources can help estimate an otherwise unmeasurable phenomenon or offer a different perspective on a known issue.

At this point, it may be useful to briefly discuss the difference between data and information, which is often framed in the equation *information = data + meaning* (Floridi 2005).³ Data are always concrete material artefacts, such as holes in punch cards or magnetic charges on a hard drive. Associated with language and mental concepts, information is more incorporeal, even though material accounts of meaning have become more prominent in recent years

³ In a critique of this formula, Floridi argues that a definition of information also needs to be contingent on its truthfulness—information that is not truthful would be misinformation.

(Latour 2013; Peters 2015). Any meaningful dataset can thus be thought of as embodying both explicit and latent information. Explicit information is what a datum is intended to represent through its value. Latent information, on the other hand, is relational; it is expressed in the internal statistical patterns and relationships among data points. A single GPS datum refers to a geographic location, but a million GPS points can reveal much more: for example, blurry areas may point to regions with poor GPS reception, such as streets surrounded by tall buildings. In this case, the two variables of latitude and longitude suddenly reveal a latent third one associated with the topography and the heights of the buildings, but only if enough data are available to let the clouds of uncertainty emerge. Just as the materialities of measurement inscribe themselves into the coordinates, no measurement only captures what is intended to be measured, but also countless other related aspects. Working with data proxies involves embracing outliers and artefacts as potential clues rather than errors that undermine the quality of the analysis.

The forensic principle of individualization can be observed in the methods used by commercial data brokers, who integrate diverse sources that relate to the same individuals but offer little overlap otherwise. The results are new hybrid datasets whose scope and depth surpass each individual contributing source. This raises privacy concerns: while each contributing dataset may be anonymous and unproblematic in itself, the resulting dataset may not be. The controversial method of *digital fingerprinting* is used to identify visitors by combining harmless data points such as the user's browser version, timezone, or the list of installed fonts.⁴ However, when taken together, they establish a unique digital context that allows identifying a digital device and tracking it across multiple websites. Any data source can potentially be used as a proxy, just as any discarded material offers clues about the activities and contexts of its use and disposal. Big data analysis of proxies is therefore not like searching for a needle in a haystack, but rather manufacturing a needle by extracting metal from a large quantity of hay.⁵ To observe social behaviours and interactions, one can, in principle, start with almost any dataset available in large enough quantities, considering that almost any aspect of life, at least in the cities of the Global North, is somehow directly or indirectly connected to digital infrastructures that constantly capture data.

⁴ For an explanation and evaluation of the own digital fingerprint, see, for example, [Electronic Frontier Foundation \(2023\)](#).

⁵ This metaphor is not as absurd as it might seem. Artist Cecilia Jonsson harvested 24kg of grass from a contaminated mining site and forged an iron ring from the metals absorbed by the plants ([Jonsson 2013](#)).

Informational Waste Reduction

The notion that any data source can potentially be used and monetized as a proxy has led to indiscriminate data gathering and archiving, irrespective of their immediate purpose. Much like single-use plastic produced for the landfill, data exhaust is bulk material often generated without a clear purpose. If data are already created with a secondary use in mind, they are no longer strictly speaking *data exhaust*; the line between intentional data collection and data recycling becomes increasingly blurred. Its value for marketing or other purposes is often taken for granted and generally overestimated, but there is little intrinsic incentive for informational waste reduction. The principle of data minimization in the GDPR policy is intended to counter such tendencies, serving as an informational equivalent to waste reduction. The German concept of ‘Datensparsamkeit’, or data frugality, is not only a countermeasure to companies engaged in surveillance capitalism (Zuboff 2019) but also to the widespread threat of data leaks that expose private information to scammers. In 2023, the national Austrian Broadcasting Corporation lost a dataset containing sensitive information about the entire Austrian population to hackers (ORF 2023).

The Materiality of Informational Waste

Since all data are material entities, informational waste has a material dimension. Challenging characterizations of digital data being efficient and clean, researchers have tried to quantify the significant environmental impact of data infrastructures such as server farms, data warehouses, or cloud computing resources. Elettra Bietti and Roxana Vatanparast describe the concept of data waste as ‘the carbon emissions, natural resource extraction, production of waste, and other harmful environmental impacts directly or indirectly attributable to data-driven infrastructures. These include platform-based business models, the programming and use of AI systems, and blockchain-based technologies’ (Bietti and Vatanparast 2020). Estimates suggest that digital infrastructure generates between 3 per cent and 4 per cent of global greenhouse gas emissions, a figure higher than that of global commercial aviation (Ferrebœuf et al. 2021).

Physical Friction

The explicit material dimension of data can be illustrated through the process of bitcoin mining. The Cambridge Center for Alternative Finance tracks

the electricity consumption of the bitcoin network, which in August 2023 amounts to an estimated annual 139.3 Terawatt hours (TWh)—higher than the annual energy consumption of all global gold mining operations, and about the same as the total annual electricity consumption of Sweden.⁶ This number is so high because the purpose of bitcoin mining is literally to waste energy. To create material friction⁷ in computational networks that slows down information transfer just enough to make it prohibitively difficult for attackers to falsify transactions on the bitcoin blockchain; a security principle described as *proof of work* (Nakamoto 2008). Transactions are encoded in nested cryptographic calculations that require significant computational effort to solve. As more miners participate in the process, the difficulty of these calculations increases (see Figure 16.2). As a result, it always takes about 10 minutes for a solution to be found and a new block with consolidated transaction records to be added to the blockchain. Remarkably, the vast number of cryptographic values computed during that process are largely meaningless—the goal of the process is arbitrarily set to find a highly improbable pattern of leading zeroes. Since a higher value of bitcoin attracts more miners, value is implicitly related to the energy wasted during mining. *Proof of work* is ultimately about creating friction in the physical world.

In a space where information is purely abstract and the physical effort of computation negligible, no encrypted communication would be safe from attacks. Cryptography hinges on the material nature of data; on the fact that it takes a certain amount of time and energy to decode messages, guess passwords, and break into systems. But cryptography and bitcoin mining are not

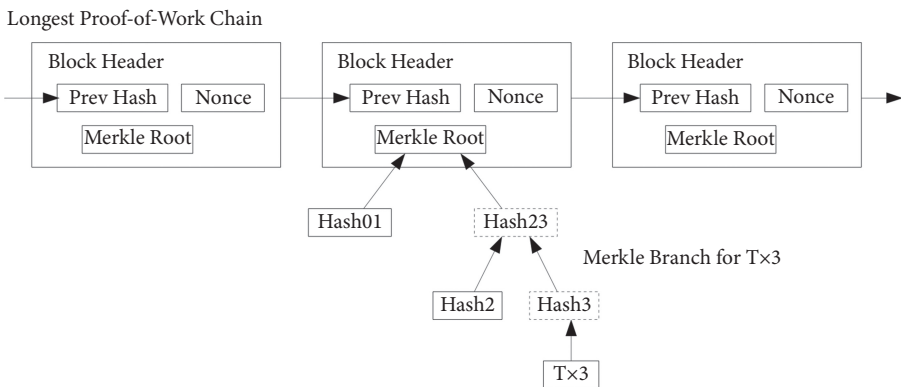


Figure 16.2 Proof of Work: Structure of the bitcoin blockchain (Nakamoto 2008)

⁶ As of Fall 2023, for current numbers, see Center for Alternative Finance (2023).

⁷ See Paul Edwards' concept of computational friction (Edwards 2013: 84).

the only areas where digital technologies depend on analogue friction precisely because they are constrained by it. The rationale for physical friction is more layered in the case of useless information clutter on the web. A primary goal of digital sludge, such as online advertisements and AI-generated filler text, is to extend the time a user spends on a page by obstructing them from satisfying their informational needs. Time spent on a page directly translates into advertising revenue, and data clutter achieves this not only by distraction and obfuscation but also by technically overwhelming and consequently slowing down the user's browser with bloated content. However, most web content is not made solely for human users. Before a user can spend time on a page, it must first be discoverable in search results. Search engine algorithms and other indexing bots are a second important audience that ad-revenue-seeking website providers need to cater to by simulating rich content and relevant connections to other sites. A third layer of friction is the measurement of attention itself, facilitated through hidden processes of data-sharing, bidding, and surveillance that are activated once a user visits a page. Since an online advertiser cannot directly measure a visitor's attention and interest in a web advertisement, ad revenue is determined based on convoluted proxies that measure time, interactions, and traffic. However, these proxies can be easily gamed by both users and website providers. Engagement metrics do not always correspond to real user interest but are often manipulated through web design tactics, automated bot networks, and click farms—facilities where low-income workers earn their wages by clicking on thousands of ads per day on a wall filled with mobile phones. On all these layers, the production of informational clutter generates monetary revenue, albeit at the expense of natural resources, energy, and a corresponding carbon footprint.

The production of informational waste closely follows the organizational logic and funding mechanisms of tech companies. Author Cory Doctorow observed that digital platforms like social media sites or marketplaces often become less useful as they mature. He coined the provocative term 'Enshittification' to describe their lifecycle, driven by intentional management decisions (Doctorow 2023). In his interpretation, digital platforms initially try to lure users by offering them a valuable service. Once they have established a large user base, they shift focus, prioritizing value for businesses such as advertisers and retailers. Eventually, the platform aims to maximize value for its shareholders, to the detriment of both regular users and business clients. At this point, the lifecycle is complete, and the platform dies. In Doctorow's account, the first step for users typically means content they did not ask for, more ads, paid articles, and informational clutter. Over time, these materials become the dominant elements on the users' screen, overshadowing content

they originally hoped to find. In the second step, advertisers and businesses become dependent on the platform, which increases their prices and plays them against each other. This dependency gives rise to another form of informational waste: arcane practices of search engine optimization (SEO), by which businesses and advertisers try to outsmart the platform's algorithm by flooding it with keywords, tags, and other metadata in the hopes of gaining visibility. However, their attempts are ultimately futile because the platform operators can manipulate the algorithm at will. Today, most online content is tainted with infotrash in the form of useless and misleading metadata and descriptors, adversely affecting AI and machine learning models trained on content scraped from the internet.

Considering the recurrent theme of machines generating informational clutter for other machines, one is reminded of the concept of *interpassivity*. This was introduced by philosopher Robert Pfaller, who describes the strange phenomenon of machines consuming media on behalf of the user, illustrated by the canned laughter in a sitcom or a video recorder that tapes shows that are consequently never watched by the owner. In Pfaller's interpretation, the laugh track laughs and the recorder watches so that users don't have to; it consumes on their behalf (Pfaller 2017). Much of the internet's infrastructure now operates on this principle: browsers fill their caches with preloaded information that a user will never see; how-to pages are cluttered with AI-generated paragraphs designed to draw out the time a user seeking information has to spend on a page. Operating systems are pre-filled with bloatware—useless software cluttered with features that are rarely useful but occasionally spy on the user in the background. As excessive data hoarding has become a common corporate practice, it is worth speculating how much of the previously undervalued data generated by computing infrastructures, now collected in big data repositories, may be overvalued—with machines analysing data for its own sake, its results never reaching decision makers.

Data materiality is again the relevant framework for analysis. In the previous examples, it is raw computing power and volume rather than the semantic information content that matter. While the value of information is subjective and context-dependent, the material aspects of information waste can be expressed in terms of carbon emissions, resource extraction, and hazardous waste production. Any account of data materiality must include the physical human labour, from miners in murderous cobalt mines to workers in click farms, and the global inequalities and environmental injustices that typically accompany resource extraction and waste disposal. In his geological account of digital media, theorist Jussi Parikka links data infrastructures to the geological formations that store the fossil fuels that power them and

those that harbour their refuse, such as carbon emissions and electronic waste (Parikka 2015). The loop is closed by technologies of remote sensing and geophysical modelling that are used to discover and extract new geological deposits of energy used to produce diesel, batteries, or photovoltaic elements.

Wasting to Slow Time

As the proof-of-work blockchain and the clutter of information on the web illustrate, waste and monetary value are inextricably linked, with value being the product of waste. The bitcoin network wastes computational resources to slow down the block generation time, thereby producing scarcity and security; many websites, and even search engines like Google itself, generate revenue by wasting their users' time and patience as they try to maximize the time spent on their site. But this may sound more polemical than it really is. The slowing of time through computational friction plays a profound role at the interface between the analogue and digital worlds.

To understand this, one has to realize that in purely digital systems, temporality does not exist. A digital device is an analogue device that has eliminated time⁸—digital algorithms can distinguish between before and after but lack any concept of duration. A digital system cannot discern whether a step takes five milliseconds or five years; it has no bearing on the result. In order to generate clock time, digital computers, therefore, rely on analogue components such as quartz crystals or analogue resonators. Time has to be brought back in from the physical world. But clocks can be manipulated and timestamps falsified. By pushing computing hardware to its physical limits, the computational friction of *proof-of-work* couples the digital back to the physical world, where time cannot be negotiated. There is a natural limit to how many calculations can be completed and how much energy can be mobilized, even if this limit changes over time. A purely symbolic world has no friction—the theoretical model of a Turing machine can calculate any computable number (Turing 1936), but its physical implementation would require a lot of patience. In other words, the abstract variable of time, which can be modified at will, is replaced by physical change, which is bound to physical limits. But computational friction has another consequence since the ability to enact physical change is also the ability to mobilize energy, labour, and resources. While a cheap computer will eventually reach the same result as a more expensive

⁸ See Norbert Wiener's comments at the Macy Conferences 'Every digital device is really an analogical device which distinguishes region of attraction rather than by a direct measurement. In other words, a certain time of non-reality pushed far enough will make any device digital' (Pias, 2016, 159).

one, the computational friction of *proof-of-work* strongly favours those with access to resources that can push computation to its limits. Re-introducing time brings back the power relationships of the social world.

However, slowing time is a difficult task in an environment of constant acceleration. For the past 50 years, Moore's Law has provided the roadmap for exponential growth in the processing speed and complexity of integrated circuits, accompanied by an equivalent growth in users and computing resources. In the example described, this requires that even more energy be expended to slow down computational processes in order to create value. Just as industrial capitalism depends on the generation of physical waste, the dialectic of computational capitalism entrains an increase in informational waste. In the case of the blockchain, the wasteful mining process re-introduces the power relationships and economic inequalities of the physical world into the symbolic space of information: miners with access to resources such as cheap electricity, space, and the ability to access and purchase the newest and fastest mining hardware in large quantities dominate those with less resources.

The preceding examples may seem related to the concept of the attention economy, which posits that in a state of general information overload, attention becomes the relevant currency (Davenport and Beck 2001). In reality, the argument presented here is almost the exact opposite. The concept of the attention economy does not consider machine attention, which plays a central role in the examples discussed above. But more fundamentally, the argument presented here is not based on the concept of semantic information or the desire to extract rare insights from vast amounts of data. Time and attention are not treated as subjective but as direct equivalents of energy, shaped by machines as much as human experience. As Doctorow notes, there is no such thing as the attention economy since attention is not a medium of exchange or a store of value (Doctorow 2023). Attention can only be monetized through observable data, which relies on technical proxies that involve a considerable amount of machine agency. The primary purpose of infotrash is not a struggle for human attention but the anchoring of an unmoored digital domain in the analogue world by spending material labour and energy.

This perspective on informational waste can be illustrated by artist Michael Saup's coal sculptures, which he describes as avatars, that embody energy equivalents of online activities such as streaming a video of the movie *Avatar* (see Figure 16.3). The avatar not only represents or references but embodies its physically stored energy. Just as geological formations and strata are manifestations of time and processes of erosion and accretion, the blockchain is a quasi-geological artefact that physically embodies carbon and human



Figure 16.3 Michael Saup, AVATAR: Incarnation cRdxXPV9GNQ (Courtesy of the artist, 2009)

labour. As geological time leads to remarkable patterns and formations, the bitcoin blockchain boasts consistently and improbably low hash values in the block headers—one of the few persistent clues of the immense computational resources necessary to find these highly improbable results of a complex computational process that results in a deterministic, but unpredictable, usually large number. Considering the close entanglement with energy, it is perhaps not a surprise that the geopolitical relationships of geological resource extraction are partially mirrored in the global landscapes of mining for attention and value. While China has recently banned bitcoin mining, it is still the second-largest mining hub following the United States ([Cambridge Judge Business School 2022](#)).

Sorting Waste and Information

As argued in this chapter, infotrash is not merely a side effect of cheap access to abundant information but is often deliberately generated to create physical friction in digital networks, which amplifies the influence of capital and power in the digital sphere. In this capacity, it counteracts the narrative of the inherently democratizing effect of digital technology, which has dominated the discourse throughout the past decades. From desktop publishing

in the 1990s to filmmaking, map-making, and data visualization, the proliferation of digital tools has challenged the monopoly of experts. At the same time, we have witnessed a handful of companies seize control of technological practices—the sprawling landscape of blogs, Usenet, and independent web servers in the early 2000s has been all but absorbed into the platforms of social media giants. To parse this paradox, it is helpful to examine the material underpinnings of digital platforms. The most exclusionary technologies tend to be those that require vast resources in terms of energy, hardware, and expert labour, which only very few actors can afford. This is glaringly obvious in the most ambitious AI projects, which require such an immense amount of computational resources and labour—both menial data workers and highly paid scientists—that the most significant breakthroughs only tend to come from tech giants like Meta, Google, Microsoft (including its partnership with OpenAI), and Nvidia, sidelining academia to a secondary role. Similarly, the generation of informational waste increases barriers, creates frictions that demand more resources, and consequently favours those who can afford them. Considering that blockchains are essentially technologies of friction, which reintroduce the notion of the *original* into digital space through vast computational efforts, the promises of crypto-companies to decentralize the web have to be taken with a grain of salt.⁹

The interdependencies of waste and value, of materiality and temporality examined in this chapter show why critiques limited to examining the wastefulness of digital technologies fall short. As the experience with single-use plastics and physical trash can teach us, waste is not an incidental by-product of convenience, it is often the purpose that drives entire industries. This contradicts the traditional, essentially moralistic view of waste as an inefficiency, which, if eliminated by exercising restraint, would leave everyone better off. McGovern succinctly summarizes this view, echoing environmentalist arguments: ‘Why? Because we can. Because it’s easy. Because it’s cheap’ (McGovern 2020, 27). A second lesson from waste management is offered by the complex infrastructure of the waste and recycling system, in which the definitions of waste change frequently and often hinge on symbolic labels. Despite the visceral materiality of waste, what is waste depends on context. If 90 per cent of data generated are crap, is a well-curated dataset that has never been analyzed, as McGovern suggests, infotrash because it takes up server space, consumes electricity and wears down hardware (McGovern 2020, 23)?

⁹ This includes the less resource-intensive *proof-of-stake* protocols, which undergird web3 architectures, see, for example, Edelman (2021).

And does the dataset then cease to be trash once it is used as training data for an AI model—even if that process consumes vastly more energy?

To overcome simplistic dichotomies of matter and information, this chapter differentiates between explicitly assigned and implicitly embodied information, which both apply to physical waste and infotrash. In the recycling industry, a simple label change can have far-reaching consequences. An old CRT TV set, deemed hazardous waste and banned from export in some states, becomes a donation for reuse that can bypass export restrictions. It makes a difference whether substances are disposed of or merely temporarily stored, even if the storage area is later abandoned through a planned bankruptcy. The categorization and informationalization of waste is a highly politicized topic. It is at the centre of informal labour and unionization efforts in the Global South and pollution controversies in the Global North. With China recently banning the import of 32 categories of scrap materials including papers, plastics, and other common household recyclables, it also has a geopolitical dimension (Wen et al. 2021). The informational-symbolic dimension matters for physical trash, just as the material dimension does for informational waste. Implicitly embodied information, which turns physical trash into traces and clues about human behaviours and past events, is also part of informational waste, where it incentivizes massive data collection and retention in the hope of monetizing insights about consumers. In this sense, data is not defined as a means to an end but as a potentiality: harmless browser configuration data can become useful for an entirely different purpose when linked with other datasets.

Conclusion

We can learn about infotrash from physical waste by considering the latter's informational rather than physical messiness. I have described the multiplicity of taxonomies of trash, their local differences and incompatibilities, and their temporal instability as a result of a messy political process that extends from the local to the global. In contrast, tech companies present their digital ecosystems as seamless, placeless, and logically consistent. The prevailing minimalist aesthetics of user interfaces conveys simplicity and universality. While the smartphone interface of the ride-sharing app Uber may look identical anywhere in the world, this seamlessness is a labouriously crafted illusion since the company has to painstakingly tailor its operations to comply with diverse local policies and labour laws. Tech companies equally

tend to avoid revealing the messiness of human labour their services rely on. Sorting data exhaust requires human labour and attention in many different forms. Tasks such as data cleaning and labelling at various stages of training and validating AI models are often undertaken by crowd-workers, an invisibilized form of human labour (Gray and Suri 2019). By foregrounding the agency of technology, tech companies deliberately downplay the substantial role of human tasks in their products and devalue these physically, emotionally, and intellectually draining activities as menial labour. Amazon's naming choice for its *microtasking* service is a self-ironic nod and a fitting metaphor—Mechanical Turk is a historical reference to a seemingly intelligent chess robot that was, in reality, driven by a human crammed into its belly (Amazon 2023a). The platform is indispensable for data labelling and AI model testing (Amazon 2023b). The worlds of waste management and AI labour come together in AI-driven computer vision (CV) systems, which are now commonly used for sorting in many recycling centres (Recycleye 2023). Just like traditional recycling centres depend on human labour for manually removing objects from the waste stream that cannot be handled by mechanical sorting methods, CV systems require manually annotating many images of waste, identifying their outlines and shapes and labelling their materials (Keymakr 2023). Just like social practices of sorting, separating, and reorganizing materials can constitute a mode of material critique, as I have shown here that focusing on the messy nature of digital work and its various materialities can help us overcome the false dichotomy perpetuated by the aesthetics of techno-minimalist design.

Finally, the promise of acceleration through immaterialization is always accompanied by opposing practices of increasing friction and deceleration. While the newest laptop may be faster, lighter, and more powerful than its predecessor, it usually comes with a new OS version that requires more memory and processing power. Bloated software upgrades slow down older machines and make them obsolete, while the progress bars on new hardware seem to keep moving at merely the same pace. Excessive online ads and background code not only serve the purpose of spying on the visitors of a website but also of slowing down their online experience to boost ad profits. Producing obsolescence by managing time, informational waste echoes the temporality of physical waste, its decay and transformation. In this sense, informational waste re-introduces analogue time into digital space, thereby generating scarcity and friction that reproduces the power structures and inequalities of the physical world.

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Attempting to Waste Time

An Exploration of Freewheeling Creativity in Kitchens and Gaming Rooms

Kelly Alexander and Joshua O. Reno

The Set Up

Covid was a gift to anyone who wonders whether it is possible, in late-stage capitalism, to actually *waste* time. In the months following the announcement on March 16, 2020, by the U.S. Government stating that citizens should avoid gathering in groups of more than 10 people, followed by the shuttering of the New York City public school system, the largest in America affecting more than one million students and their families, the wasting of time became a dominate theme in Western media discourse. A few examples:

‘Yes, We Need People to Stop Working. But We Don’t Need Them to Become Unemployed’, *The Washington Post*, 26 March 2020

‘How to Stop Wasting Time during COVID-19: Treat your time like the valuable commodity that it is’, *Psychology Today* headline, April 2020

‘2020 felt like a “wasted year” for many young adults’, *Vox*, December 2020

‘We’ve Lost Two Years to Covid. It’s Time to Grieve’, *New York Times*, December 2020

‘Now is the time to stop wasting time’, *Forbes*, January 2021

Yet for contemporary understandings of capitalism, time cannot be wasted. After all, even the most banal of activities like eating a banana, flushing a toilet, or scheduling a routine doctor’s appointment have utility, dependent on someone else’s abstract labour, and producing lasting effects on global supply chains and the planetary environment. In the service of unchecked capitalism, it is all too easy to imagine our time as always spent in service of a great profit machine; one that rewards only those who hold the means

of production. As the saying goes, ‘time is money’. Our object of critique is precisely the message and spirit of that adage.

We began simply enough, by taking a seemingly universal truth, that wasting time is impossible because it always enfoldes participating in capitalism (even by ‘wasting’ money), not as a given but as a provocation, as a kind of dare. Because claiming that time cannot be wasted felt to us like a tautological argument—such that all time doing anything and even doing nothing comes back around to the fulfilment of capitalism—we took it on as such, and then sought to determine if we could break the tight bind of such circular logic. It is admittedly a contrarian approach, and one that builds upon our individual and collective previous work; Reno has written an ethnography about a landfill in Detroit and argued for it as a lively space of creativity even as it inhabits a proverbial wasteland, and Alexander has an ethnography coming out about working at three grassroots sites in the EU that recuperate and recirculate surplus supermarket food with the intention of disrupting the industrial food system. Our mutual interest in reshaping the ways in which waste and time connect and to what ends prompted us to issue a mutual challenge to one another, with one goal: interrogating the possibility of abandoning, for a time, the world of efficacious and productive time in favour of another rich and diverse world of freewheeling (non-) creativity. Could we each avoid doing an activity hastily, while producing nothing of real value, nor following any prescriptive plan? Thus came the challenge we issued one another: ‘Go forth, friend, and try to waste some time.’

The first step in operationalizing our experiment was to consider the essential question: ‘Which actions and activities constitute wasting time?’ To address this, we turned to sources we thought would be ideal: ubercapitalists, that is, supposed captains of industry who have not only acquired fortunes but have also written a book about the dangers of wasting time, including advice on how to avoid doing so. Byron Reese is a venture capitalist and so-called ‘futurist’ concerned with human efficiency. His book *The Fourth Age: Smart Robots, Conscious Consumers, and the Future of Humanity* outlines his view on the ways in which technology has, and will, continue to improve human experiences, and touches on wasting time. For him, efficiency is the opposite of waste; he argues that things like batteries and inefficient car technology and even ‘unnecessary trips to the doctor’ should be perceived as ‘negative ... even if they make jobs’ and that if you do not agree, ‘then we should all repeal littering laws and encourage people to throw trash out their car windows to make new highway jobs’ (Reese 2018, 115). With Scott Hoffman, a founding partner of a Republican political lobbyist organization, Reese co-wrote *Wasted: How We Squander Time, Money, and Natural*

Resources—and What We Can Do about It (2021). This work argues that human beings have been fascinated by the most efficient ways to spend their time since antiquity. By way of example, they offer Seneca, who called wasting time ‘heedless luxury ... spent on no good activity’; Shakespeare, in which Richard III says ‘I wasted time and now doth time waste me’; and current studies by the US Defense Department on bristle-thighed curlew shorebirds who can go 13 days without sleep (Reese and Hoffman 2021).

Accordingly, any job in which someone is paying you cannot be considered wasteful. If someone pays you to do a task, regardless of how mundane, irrelevant, or boring it might be, it then becomes worth money. Perhaps unknowingly confirming Marxist definitions of abstract labour time, Reese and Hoffman are expansive in their notion that wasting time is hard to achieve. For example, they note that the average American spends four hours a day watching television, which they argue is not a waste of time. It costs money to produce these shows, and viewers pay for them when they watch accompanying advertisements. Despite this admission, Reese and Hoffman eventually come around to defending Henry Ford’s idea that those who are most successful in life are the ones willing to work when other people are not. Unable to define what is wasting time, they settle for what wasting time is not and come down on the side of technology:

We don’t walk up the hill to haul water from the well anymore; we turn on the tap. Imagine household chores before electricity: washing clothes before washing machines, heating a home with wood, et cetera. (Reese and Hoffman 2021, 233)

By this conception, wasting time means taking longer to do something than one must.

The question of the impossibility of wasting of time in a capitalist universe struck us as the basis of a gendered, reductive, and insulting concept hurled equally at ‘happy homemakers’ as well as at ‘wastoid’ gamers. We intended to explore it—far from a frivolous pursuit—being able to waste time is a question of agency, and even of hope. Therefore, taking Reese and Hoffman’s provocation seriously, we conducted our experiments to purposefully waste time by choosing a favourite activity and then expressly taking a longer time to do it than it required.¹ One of us chose to cook strictly for pleasure and not to make meals for herself or anyone else; the other chose to play videos games for fun

¹ To clarify, we did not first encounter their book and only then begin our respective time-wasting experiments. It is accurate to say that we had already begun these activities aware of popular beliefs about wasted time that were broadly held to be true in a capitalist society and that circulated in new ways during the pandemic, beliefs to which their book gives expression.

(or so it seemed). We referred to the guiding spirit with which we conducted our attempts as one of *freewheeling creativity*, by which we mean a casual and relaxed attitude that helps one feel unrestricted by the usual rules and boundaries about how long the activity should take. This spirit allowed us to make new kinds of choices from the ones we would usually make, and to take unexpected risks with our individual time and resources. In willful attempts to practise freewheeling creativity and intentionally waste time, we wanted to see first if such a thing was possible, and then, if so, what other kinds of affects and politics could come with the thrill of subverting capitalist logics.

Methods

Freewheeling Creativity in the Kitchen

For the first few months of the Covid pandemic, Alexander decided to try a cooking experiment she had long wanted to attempt but could never find time to make it happen for herself. This was to become good at making her own bagels. Or, rather, to become proficient at making good bagels. This was deliberate. In the first place, bagels are ubiquitous in American groceries and relatively inexpensive; making them requires much more time than buying them. Bagels are also something that Alexander had zero experience making but require a multi-step process with many potential pitfalls. This would be a good chance to explore whether making a misstep was, as a capitalist might argue, still a productive move towards an end goal, or whether sometimes an error produces nothing of value at all.

Her first step was sourcing a recipe, which meant perusing books in her personal cookbook collection. As a former food magazine editor, she has more than 200. Additionally, the internet was searched for bagel recipes. This researching process alone took longer than it arguably ‘should have’ and was inefficient, since according to Reese and Hoffman, one indisputably authoritative source—say, *The New York Times Jewish Cookbook*—could provide the best recipe. A good way to waste time, then, might be to compare many different recipes and techniques: some from verifiable sources like *The Times* and others from random strangers posting making bagels on YouTube. The latter revealed any number of unorthodox methods, including one that eschewed traditional boiling in favour of a Japanese method of slowly gelatinizing a portion of flour and water—a method that challenges the notion of what technically constitutes a bagel, and thereby arguably wasting time in a philosophical way.

Searching for something *after* one has arguably already found a perfectly acceptable way of doing it can be wasting time. But the attempt to perform freewheeling creativity did not stop there. For months, Alexander then tried out some of the bagel methods, making one or two a week. This required copious amounts of flour, which, during quarantine, she chose to have delivered from Instacart, rather than risk going to the grocery store, and exposing herself to the virus when this was absolutely unnecessary. Using Instacart is arguably not a waste of time, because according to Reese and Hoffman it means the shopper can be busy doing something else—say, working—instead of grocery shopping; the Instacart worker is a utilitarian ‘water tap’ when before we had to go to the well. And yet in this case it also arguably *was* a waste of time, from another, perhaps more phenomenological point of view, because it was a more expensive and time-consuming way to procure ingredients, considering the fees and lag times associated.

This is a good time to acknowledge the massive privilege that the experiment turned out to require. An immediate way this made itself clear occurred during the amassing of ingredients for bagel making. To make bagels, one needs: access to water and way to warm it; a place to buy active dry yeast, sugar, salt, eggs, and flour; an oven for baking; a large pot for boiling the bagels, and of course, money to pay for the ingredients, electricity, and water. You need tools for measuring ingredients accurately, plus bowls, pots, and baking pans. You also need an able body with two hands for dough mixing, able eyes for determining doneness, and the general health to hold your body upright enough to carry, mix, measure ingredients. Therefore, even attempting to waste time is an activity only physically strong people who have secure jobs, places to live, and means of supporting themselves can attempt; without that kind of physical health and social security, it is in fact not possible to waste time. Lesson number one: practising freewheeling creativity is both ableist, and expensive. During her bagel trials, Alexander recalled reading about the tribulations of the nineteenth-century electrical engineer and unabashed capitalist Guglielmo Marconi, who, while desperately attempting to get his newfangled wireless technology to transmit messages from one cruise ship to another in a race to be the first to do so, was discovered one day by his wife in the process of tossing his dirty socks out of a porthole in their stateroom—a practice which, he reportedly explained, made sense because it was ‘more efficient’ to get new ones than to wait for the worn pairs to be laundered (Larson 2006, 286).

Back to the bagels: Using Instacart to order groceries necessitates supporting an economy based on unethically cheap labour and a global supply chain that subsidizes and commodifies wheat prices to keep them artificially low,

which takes advantage of farmers by making them dependent on the state. Beyond even that, in her process of learning to make what she considered good bagels, Alexander used the ingredients with reckless abandon. This means she made many mistakes along the way as a first-time bagel baker: too much flour, not enough flour, not the right kind of flour, etc. And those were only the beginner mistakes. Boiling bagels turned out to be a tricky process that resulted in countless soggy yet edible bagels that she ultimately did not consume and threw away—wasting time and money in the process. It may be tempting to argue that every step she took enabled capitalism, from viewing advertisements on YouTube to tipping the Instacart driver, to throwing away ugly yet edible bagels. It was also a successful process of freewheeling creativity. Lesson number two: it is indeed possible to conduct activities that exist beyond the realm of abstract labour time, beyond the idea of what spending time wisely should feel like and look like.

Gaming for Pleasure and for No Real End

Reno had been gaming more and more intensely even before the pandemic hit, but that only sealed a deal he had made with himself: that this was fun, and that that pleasure mattered in some way. But Reno did not find himself just interested in games, pure and simple; but in finding old games to play on old system the way it would have been when they first emerged on the market. Such ‘retro-gaming,’ he learned soon after, was increasingly common and it exploded during the pandemic, supposedly as people (almost always assumed to be men) looked for things to do while stuck at home and found old gaming systems in storage. Gaming retailers noted boosts in sales from trade-ins and refurbished consoles and handhelds. If this was fuelled by nostalgia, isolation, and boredom, for Reno at least it was a fabulous way to waste time and money, whether endlessly scrolling eBay for a specific copy of a hard-to-find game or stopping, in mask, by one of two local shops that specialized in reselling games and devices.

Lesson number three: it is possible to waste time trying to create an experience instead of having one. For one example, Reno became obsessed with playing a classic game for the Super Nintendo (SNES) known as *Final Fantasy VI* (1994). This specific game is considered by many to be one of if not the best one of the long-running and beloved Role Player Game (RPG) franchise. The SNES cartridge is very difficult to find for this reason, especially English versions since it originally sold poorly in the United States. So, Reno eventually paid around \$50 for one he found on Amazon.com in 2021 from

a purportedly reputable seller. He then paid another \$100 for a used SNES to play it on, only to later find out the cartridge was a fake which meant, while playable, it did not allow for progress to be saved (which in a game requiring roughly 35–40 hours of average gameplay, according to users of www.howlongtobeat.com at least, was just not feasible). Talking to other retro gamers online revealed that it was hard to identify fakes, even sellers had trouble, until you tried to play and save. So, Reno tried again, this time finding an \$18 Game Boy Advance (GBA) mini cartridge of the game on eBay in 2022 that he could play on his Nintendo DS (a handheld device for which he spent another \$100 at a used game store). This version was still more or less like the original, once again, however, it was a fake. Frustrated, Reno finally bought a disc with a mostly identical version of the game for the original PlayStation (a console which he also owned). Of course, all of this contributed, in some small way, to a robust online and in person retail market in used and fake games. People, stores, and online companies made money from his transactions.

From Reno's perspective, this was also all waste; all obstacles in the way of his objective, but no less meaningful for that. All these dead ends—three consoles, a handheld device, two fake cartridges—fail to add up to a collection of assets (like old baseball cards or comic books). Even if they were worth something, which was unlikely, if they were meant for resale and preservation, then he should not be playing them at all! But here is the real rub: there was a shortcut to gameplaying that he had avoided. All he had to do to play this game if that was all he wanted was to go onto the 'My Nintendo Store' and download the '2D pixel remaster' of the game on sale for \$17.99. He had had the latest console/handheld hybrid from Nintendo, the Switch, since 2021, but wanted to play the game 'as it was played originally': not a remastered version, on a system for which it was intended (a fourth-gen console), and not a brand new, eighth-gen, Switch. That was where his freewheeling creativity led him, wasted time, money, and effort be damned, for devotion to retro gaming. Lesson number four: dead-ends and roads that lead nowhere are the paths to wasting time.

To summarize purchased commodities though each of the two experiments may have involved—and again acknowledging the privilege of access to the things that capital enables in both experiments including electricity, high-speed internet connections, joysticks, pots, pans, sacks of flour, etc.—we find that so-called 'time suck' activities that take longer than they need to are never the endpoints of pleasure. In the excess of time spent doing them, they are, in fact, the points in time when pleasures begin (Miller 2011). While our experiments began as hypothetical flights of fancy, the real experiences of

freewheeling creativity we had while performing them illuminate the stakes of our proposition, which is that figuring out how to waste time is an economic, political, and social dilemma worth undertaking. Deliberately spending more time to complete an activity than you would if you were only concerned with efficiency involves spending more time to solve problems instead of less. As we have found, wasting time involves honing one's ingenuity, expressing one's culture, and devising new possibilities for the future of everyday habits and practices. In uncertain, troubled, and troubling times, wasting time by 'taking too long' doing something fun might inadvertently produce a small amount of capital, but it is outweighed and overridden by a feeling of fun.

Analysis

Is it possible that Marx lurks in kitchens and gaming caves? Of course, yes. Many anthropologists of both food and play turn to the political philosophy of Marx as a lens through which to consider the ways in which any product acquires value. Or, better said, the ways in which labour power is represented and exchanged such that products appear to have value of a certain kind when they are represented and exchanged (Pedersen 2013; Elson 2015). This value theory of labour shows how capitalism constitutes class distinction and allows for an analysis of commodity chains to map readily onto notions of how certain people have access to certain ingredients, preparations, and techniques that others do not (Mintz 1986; Klein 2021).

Connecting this to the wasting of time, we thought of the classic Marxist example of the fish who does not know he swims in water until the water is gone:

The 'essence' of the freshwater fish is the water of a river. But the latter ceases to be the 'essence' of the fish and is no longer a suitable medium of existence as soon as the river is made to serve industry, as soon as it is polluted by dyes and other waste products and navigated by steamboats, or as soon as its water is diverted into canals where simple drainage can deprive the fish of its medium of existence. (Marx and Engels, 2010, 58)

If the essence of the cook is the kitchen, is it no longer a suitable medium of existence once the kitchen becomes a place made to serve the wheels of capitalism, polluted as it becomes with ultra-processed convenience foods, unnecessary gadgets, technology that makes it possible to create a

long-simmering stew not in days but minutes? And if so, of what is the cook deprived in the process?

One thing of course is creativity, another is the pleasure of crafting a meal for its own sake, not only for sustenance but also as the expression of one's heart and art. That can lead us back to another quote from Marx and Engels, in the *Theses on Feuerbach*: 'Man [sic] must prove the truth—i.e., the reality and power, the this-worldliness of his [sic] thinking in practice' (Marx, and Engels, 2010, 6). In seeking to rehabilitate the kitchen from this framework, at least for the duration of a months-long experiment baking bagels and failing and baking them again—for fun, not to sell or even count on eating for breakfast—it tests the theory, the so-called 'truth' of wasting, in practice. What Alexander learned making a bagel is that it takes at least five hours to make a batch, costs much less than to buy them (about 10–35 cents apiece, versus \$1.25 retail at date of writing), yet requires a lot more time to perfect a reliable technique and consistent results—measured in months of training. Lesson number five: bagels are fetishized exactly for the reason Marx argues, which is that if people had to make their own and knew the kind of labour involved in the process, 'bagels' as we know them—the endlessly and effortlessly available suprasensible commodity—would cease to exist.

None of this is news. Analyses of the way single ingredients become products of global capitalist systems, such as sugar, tomatoes, and salt, are useful introductions to Marxist thought. They prove that Marx is indispensable in understanding what happens when any raw material is commodified, but they fail to explain significant aspects of culture that are connected to such processes. This is why some feminist historians argue against single-subject commodity studies in the first place, because such studies insist on object-based fetishism, 'a collaboration that has produced an unending stream of single-commodity histories and ideologically worrisome localist politics' (Tompkins 2012, 2).

Yet, part of capitalist modernity is not only valuing, but disciplining labour. We believe that the present moment, especially when it comes to American culture, involves representing non-labour, wasted labour, and especially the 'wasting' of people who are deemed unproductive because they do not or cannot fit into typical categories of worker. Making bagels is also wasted labour; Alexander was not doing her job. In fact, she was engaged in a process that a factory worker or even a machine could do. Yet while doing it, she had found herself again, like a fish that was flipped out of the sea that had managed to land back in it. The years of academic training meant being estranged from cooking for fun, from experimenting. Finding herself in 'water' again, Alexander took delight in every puffy-soggy bagel, enjoyed waking up early

on a weekend to try it again, and thought she had never tasted a bagel as good as the one she finally made that tasted good to her. The process of poorly making a lot of bagels, wasting tons of ingredients, and even throwing away edible, if ugly, food, transformed the kitchen from a space of usefulness and productivity into one of fruitless experimentation, unnecessary steps, literally soggy results, and a lot of joy. Lesson number six: wasting labour is rewarding.

This is surely evidence that there is more to the story of spending time in contemporary American life than mere consumerism. Put differently, critiquing consumption and consumerism, which is the primary and moralizing focus in many contemporary debates about both time and waste, fails to acknowledge the value of creative practices. In our experiment, we have been acutely interested in the social demand that one bend all one's activity, all their time, towards the arc of productivity (Dean 2008). For this reason, we take the exchange value of both food and games as a beginning rather of a challenge, than as an end zone. But critiques of consumption can miss something else, the necessary for an additional critique of 'assetization' (see Birch and Muniesa 2020), as this is the process by which creativity is even more often captured by capital in contemporary capitalism. After a console, a game is purchased, further rents may be paid for Wi-Fi, for online play, for new gaming experiences ('skins' for characters, for instance), not to mention on social media platforms (especially Twitch and Discord) which promise to connect players to one another or to sponsorship for specific players (professional online gamers and content creators) to do 'speedruns' or to play games and chat while barely dressed (in ways that are also very often gendered). The point is that everywhere today labour and value are only the beginning, the grounds to encourage gamers to pay further rents for exclusive and continuing access to virtual assets of different kinds. Wasted time becomes yet another resource to tap for profit.

In both experiments, we have used Marxist ideas about value and time to consider how our labour, as players in the larger game of neoliberal capitalism, can be realigned from productivity to fun—and perhaps in the process made even more 'useful'. The stakes of the experiments, then, involve resisting the notion that every moment of every life is no longer safe from its possible productivity or exploitation. Lesson number seven: time that is not directed towards the achievement of a goal, or else towards an activity that some other person might measure as worthwhile by pressing 'like', is a way to observe and participate in an ethnographic accounting, or critique, of fun.

In addition to finding Marx in the kitchen, waiting to transform the kitchen and gaming rooms from spaces that quantify productivity into spaces that qualify creativity, we also wondered this: Is it possible that Foucault lurks in

kitchens and gaming caves, too? We are not the first to do so. Chloe Taylor argues that the activities of the Animal Liberation Movement ‘take on aesthetic rather than moral strategies’ to pursue their pleasures, an action she connects to the aesthetic-driven model of ethics Foucault articulates in *Care of the Self* (Taylor 2009, 72). Like Taylor, we are interested in Foucault’s articulations of ‘techniques of the self’. Taylor reads Foucault as arguing that the attention of ancient Greeks to dietary regulations have given way to ideas and activities related to sex, and we find in it several interrelated personal concepts and actions—one’s identity, one’s methods for self-care, and one’s techniques for self-expression, that connect to our experiments to waste time.

For one reason, his arguments are useful in thinking about how both the kitchen as well as the gaming room are spaces that can help eliminate gender divisions over who ‘gets’ to cook or play and why. Foucault’s most food- and game-oriented work by far, certainly in terms of analysing the role of these forms of consumption in contemporary life, is as Taylor has pointed out in the case of food, and Brad Millington (2009) in the case of games: *The Care of the Self*, the final volume in *The History of Sexuality* and in fact the author’s final book. This marks an important shift from one *episteme* to another: from genealogies of power towards its practices of the normalization of bodies. While Foucault’s first section deals explicitly with the treatment of sexual dreams in a text from Aretemidorous (for whom penetrative sex is a ‘game of expenditure and profit’ (Foucault 1986b, 30), the rest of it contends with the first two centuries AD and an in-depth analysis of Roman and early Christian thought within that time frame. He emphasizes a growing interest in ‘cultivation of the self’, which he explains as ‘an attitude, a mode of behavior’ that ‘became instilled in ways of living; it evolved into procedures, practices, and formulas that people reflected on, developed, perfected, and taught’ (Foucault 1986b, 45). To be clear, the ‘cultivation’ of these practices was not for its own sake, but towards a goal of allowing individuals to master their cravings—to experience ‘enjoyment without desire and without disturbance’—so that they could be more law-abiding and less at the whims of base instincts that foment ‘cravings’ (Foucault 1986b, 68).

These arguments about the uses and meanings of pleasure also relate to wasting time because they help to resist or challenge pervasive ideas that cooking is a utility and not an art, and that gaming is even less than that—that it can be reduced to a mindless frivolity. In *Care of the Self*, Foucault frames a conception of ethics as an aesthetics of existence, or an art of living, and offers a way of understanding such activities as we describe not as productive per se but as requirements for a good life. His work illuminates the ease with which one may assume that food cooked for fun rather than sustenance,

and games played for fun rather than education, seem useful to governmentality. For example, neither space is devoid of the effects of rules made and imposed by the state and its quasi-autonomous institutions and regulatory partners: all food for sale in American grocery stores is at the mercy of the United States Department of Agriculture's regulations of commodity crops and the Food and Drug Administration's labelling restrictions; all games for sale in the country are at the mercy of Congressional rulings over the First Amendment and ratings of the self-governing Entertainment Software Rating Board. Indeed, the long arm of the US government easily mobilizes and regulates both food and games to exercise control over the bodies and actions of its populace. Such restrictions encourage us to regulate ourselves as consumers and conduct our own conduct, as Foucault put it (1991, 87–104).

From the beginning our experiment posited: to be sure, games and food can work as tools of neoliberal governmentality (see, e.g., Tanke 2007; Millington 2009; Whitson 2015), but must they? Alexander found it easy to avoid excessive regulation simply by making the same thing over and over again, regardless of how much of the same material she bought, or the usual disciplining techniques of the body: making bagels at midnight does not mean you will have to eat them for breakfast just because Western culture approves of bagels as a breakfast food and not as a midnight snack although those categories themselves are Western inventions and 'regimes'). Reno found, in the used games market, that acquiring a specific game to play does not mean making more money for game companies or gaining cultural capital: learning to detect a fake reproduction of a classic SNES game, for instance, may involve cultivating new affective capacities, new ways of orienting oneself to cartridges as something other than commodities to play. That can make you a more discerning buyer (how very neoliberal!), but it can also just be an afternoon spent wasting time. Of course, doing these things requires both awareness and desire. Awareness in the sense that, governance aside, there is pleasure knowing that no one knows what you do with what you buy. And desire, in the sense that without making up one's mind to subvert convention, the two authors will end up fish swimming on soil. Free-wheeling creativity is a choice made about how to spend time and what it means. And in making such a selection, according to Foucault—opting in to 'rules of conduct that enable one to achieve these ends through the choice of appropriate means' (1986, 67)—it asserts that one potentially powerful programme for subverting corporate and state power is to freewheel it even within those same spaces that are tightly regulated: to use the kitchen and the game room for acts of aimless creativity, or even useless experimentation. Lesson number eight: wasting time means not being a conductor of one's own

conduct and instead going where an activity leads you, rather than leading the activity and the common social perception of its demands.

The very idea of wasting time will strike a true capitalist as painful. And to that person, our experimentations in deliberately wasting time through acts of freewheeling creativity in the kitchen and game room would prove that neoliberal capitalism is particularly good at leveraging our own pleasure-seeking against us. In other words, that cooking for a real reason such as sustenance of oneself and/or of others, that playing video games for the fun of it, are precisely the sort of activities that unregulated marketplaces are designed to promote: they are not needs, they are wants. Yet Dean explains that neoliberalism works according to a sleight of hand by which neoliberal agents convince us that our governments are stealing the enjoyment we ought rightfully to have (Dean 2008, 57). This process is clear from the way some big tech companies promise to build platforms (for a fee) where we can experience the pleasure of things like cooking and gaming in new ways. With gaming, this includes online complements to consoles, handhelds and PCs mentioned above, like PlayStation Network or X-Box Live. Players are encouraged, even if they are not playing with or against other people online, to compare their own skills with others, to see if they have the same achievements as others who played the same game or whether their achievements have them atop a 'leaderboard' of friends and strangers who also play. Games themselves are developed with social media-style ranking in mind now, so that players can instantly share an achievement, such as having beaten a particularly tough boss, or a game, on a hard setting, or in a unique way. All of this is designed to encourage payments to the gaming companies, who are now not only producers of games but renters of assetized online spaces for social comparison and competition around those games.

American publishers have come to dominate the cookbook landscape in a similar way. In the age of internet, scholars across disciplines that intersect with Food Studies predicted that online recipes would supplant cookbooks as guides to cooking: 'The cookbook is dead; just get your recipes online,' the British cooking teacher and celebrity Delia Smith told *The Telegraph* (Singh 2017). Yet she was incorrect. Contrary to their demise, the global cookbook market has expanded to a \$4 billion business, one ruled by American publishers and authors (Johnson 2014). Book industry analysts estimate that 17.8 million cookbooks were sold in the United States in the year before the pandemic, and that in its wake those numbers rose: coming into 2021, 3.6 million digital books and almost 23 million cookbooks were sold around the world, with American publishers dominating the landscape (White 2018; Mancall-Bitel 2021). With their luscious photography, promises of beautiful gourmet

dishes, and positioning of cooks as the affective bosses of the lives of all they love and all who love them, these books sell much more than formulas designed to teach people to cook—they sell a fantasy that relies on imaginary aesthetics rather than the real work of messy experimentation. Readers of them may be entertained, transported, and even inspired by the cookbooks' contents as they invest their capital in the promise of vicarious pleasures that they then may never produce in their own kitchens.

These are uses of pleasure that do not involve Ancient Greek cultivation in Foucault's articulation of it in *Care of the Self*, but rather corruptions of it. Our experiments seek to understand if we might examine these practices differently. One of way of doing so would be to strip them of their fantasy inducements and instead engage in the very real mess they both necessitate. For instance, cooking is an iterative process: to make a dish is to follow a recipe, a series of ordered steps that end in the dish's completion. Yet errors in following the process—mismeasuring, mistiming, a broken stove, etc., do not simply evolve out of the process. You could make 1,000 bagels and still mess up on the 1,001, and for a multitude of reasons from user error to equipment failure to the humidity in the air on the day you baked. This makes knowledge about cooking not useless but tentative and based on practice, on craft processes rather than technological ones. Being able to make any dish originates with a process of freewheeling creativity, the kind it takes to produce an understanding of what happens when you take a collection of ingredients and transform them into something that does not resemble its constituent elements; think of French Toast, a dish that consists of four ingredients (eggs, stale bread, milk, sugar) that, when combined with hot fat in a pan over high heat produces something entirely different than any of its foundations. This truth reveals the importance of experimentation, rather than taking the most expeditious route to obtaining French Toast (which will always mean buying it outright, already made). Freewheeling creativity means delaying one's gratification in service of learning of how to take a few things and make them into something that tastes good, plus the understanding that wasting bread, eggs, milk, and sugar, and time will likely happen on the way to 'tastes good'.

Cooking is so widely understood as productive that many of us must be reminded of the fact that its success is based on error (i.e., that in the kitchen, as in other 'workshop' spaces, practice makes perfect). On the other hand, gaming is so clearly assumed to be unproductive that we are required to show how doing so might be rewarding. Yet if one follows online conversations among devoted gamers, the 'time suck' of a good game is not understood as a problem. Indeed, it is generally assumed that some games, especially popular recent ones like *Hollow Knight* (2017) or *Elden Ring* (2022), demand

that players ‘grind’ (meaning to play repetitively, even monotonously) to ‘git gud’ (meaning to improve, in a phrase intentionally misspelled with a note of irony, a linguistic demonstration of the error-ridden process of game play). While there are not schools that teach how to game properly as exist for cooking, there are countless guides online, in written and audio-video form, including some dedicated webpages for all games (like IGN and Strategy Wiki) or for specific series (like *Zelda Dungeon*). There are even discussions and debates about whether using guides is appropriate, or a sign of being a weak or inexperienced gamer. When these discussions happen, more to the point, they may index ‘wasting time’ the wrong way (not by grinding, but by making needless errors) as something to avoid with the help of guides. In a 2021 Reddit post ([TicoDreams 2021](#)), one gamer summarized this argument: ‘There is no shame in using walkthroughs or guides when playing video games.’ One commenter, dahk16 responded, ‘I know I suck at figuring shit out. I wanna enjoy the game, not be stuck in the same room for an hour.’ Another agrees, ‘JonWatchesMovies’ referenced the focus of our chapter, ‘Agreed. I use them if I’m stuck at a puzzle or lost. I’m playing these games for fun, no point getting bogged down and wasting time on the boring parts.’ Here even a form of time wasting that is socially regarded as such, even by players themselves, still has forms of playing badly that can be characterized as wasting time because they are not pleasurable.

Conclusions

The material practice of learning how to combine ingredients to make a dish, or to play a game is not only the most everyday form of knowledge, but also the culmination of the most common, everyday waste of time. In our Analysis we drew upon some valuable Marxist insights concerning the way in which labour is disciplined to produce value of a specific kind (i.e., exchange value for the accumulation of profit). From there, we have argued that time wasted is potentially anti-capitalistic insofar as it promises escape from circuits of wage discipline or, more recently, assetification through the ‘likes’ and ‘five stars’ of what has become known as communicative capitalism. This led us, as it has others, to consider Foucault’s work on the history of sexuality as a touchstone for rethinking the uses of pleasure in our everyday lives today.

Granted, it is a long jump from the ancient Greeks to us supposedly modern Americans, as bit by bit, century by century, through processes and experiences of sovereignty, discipline, and (in)security, an initial ethos of self-care through discipline turned us into the products of late capitalism we now

are. In the ancient Greek ethos of the regulation of the body to make for better citizens, we might situate the emergence of cuisine and gaming culture. In both cases we refer to the development of an activity that is 'not simply a source of pleasure but a multifaceted discipline' in which 'historical sociological, elements and philosophies of taste' are interwoven (Davidson and Jaine 1999, 322).

This is not to simply insert some Foucauldian logic into the development of either of these activities as an exercise in pop-culture remixing, but rather to incite a change in the way we understand wasting time. We argue that although today's food and game culture, the preoccupation with regulations of edible materials (vegan, pescatarian, Keto, lactose intolerant, gluten-free, dairy-free, Kosher, etc.) and appropriate content (rated E for Everyone, Everyone 10 and older, T for Teen and Up, or Mature 17 and Up), seem recent. Foucault helps us to appreciate that the roots of eating and play can be traced back to the formalization of the discipline of the self in the second century. Once we understand this, we recognize why wasting time in the kitchen or game room can be imagined as an active means of subverting sociopolitical control. Of course, evidence of social control remains, not least in the gendered divisions of cooking and gaming. It is no accident that in the case of our own authorial division of labour, people identifying as men like Reno are far more likely to be gamers than people identifying as women like Alexander, who are far more likely to be cooks. We would add to this, following Foucauldian approaches to gender performativity, that these activities do not exist apart from gender identities any more than they do sexual ones. We have little doubt that these activities are gendering and thus help define spaces of the kitchen and the game room as feminine and masculine, respectively (Shapiro 1986; Weeks 2011). Much more on this could be and indeed has been said by gender scholars, but we have a different, if related, angle: what if cooking for pleasure and playing video games in these subversive ways mark a kind of activism?

In the age of waste, is it possible to waste time? That is the question with which we wish to conclude but have not (yet) answered. We do rebut the argument that if wasting time is an anticapitalistic activity, then it is not wasted. Certainty about what the political potential of cooking and gaming possibilities are would mean domesticating these as active practices, as things to do and not merely to contemplate as wastes of time. The results of our experiments show us that it is the performing of them that matters. The simplest way to assess the relationship to contemporary capitalism is to ask what one is *not* doing while immersed in cooking for pleasure or game play. Attempting it alone was more fun than either of us would have thought, hence

freewheeling—our experiments felt marvellously transgressive, and yet were such a small act of subversion, such little things one might do (one with privilege and an able body, that is) in a kitchen or gaming space. Yet doing them did slow down time, and make it feel expansive in the way it perhaps evokes childhood. We also were sure to choose what were inarguably the longest paths to the destinations we chose (if good bagels and good video game scores can be considered destinations, which of course for us they can). And that felt marvellously transgressive, too—to take the very, very long way around a problem. If we can do more of that and frame it as a social movement, we can perhaps resist the pressure to be always and eternally productive. Final Lesson: freewheeling creativity means wasting time in our kitchens and caves for the purpose of finding a few pleasures that capitalism cannot claim. It is possible.

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