Waste Matter: Public Art and the (Im)Materiality of Post-Colonial Memory

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Declaration

“This thesis represents partial submission for the degree of Doctor of Philosophy at the Royal College of Art. I confirm that the work presented here is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

During the period of registered study in which this thesis was prepared the author has not been registered for any other academic award or qualification. The material included in this thesis has not been submitted wholly or in part for any academic award or qualification other than that for which it is now submitted.”

16 December 2024

(Marisa Ferreira)

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This thesis is dedicated to my father, whose love and support continue to inspire me, even in his absence, and to my children Emma and Stefan, whose joy and strength have been my inspiration throughout this journey.

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FOREWORD

Growing up in Guimarães, Portugal, in the 1980s, I experienced a childhood shaped by the city's industrial landscapes. Former textiles factories with high brick chimneys tracing the path of the river Ave became urban traces of an industrial past left behind with the increase in production in Asia in the second half of the 1980s. The sound of the machinery was replaced by the sound of water and the fragments of broken windows cracking under my feet. For my friends and me, these abandoned buildings were not symbols of loss: they were spaces of wonder, of discovery, of collective memory, of joy, a playground with open spaces and large windows in constant transformation. Decaying objects, a ceiling that had fallen down, the green moss growing between the floor cracks, the rusting metals, the collapsed concrete, the smell and moistness of the wooden furniture. Rather than seeing these spaces as disposable, we embraced them as landscapes of imagination and joy.

My interest in industrial landscapes arose from my time in Biella, where I participated in an artist residency focused on socially engaged art at UNIDEE, at the Cittadellarte – Michelangelo Pistoletto Foundation in 2017. I loved Biella for the richness of our spatial encounters and engaging discussions, and for helping me to shift my attention towards my own roots in a context of industrial decline and loss. That residency planted the seeds to this autobiographical note and my desire to reimagine waste spaces not as remnants of the past but as sites of transformation, where discarded fragments foster new beginnings. Here I suggest the subversive potential of waste material to spark change.

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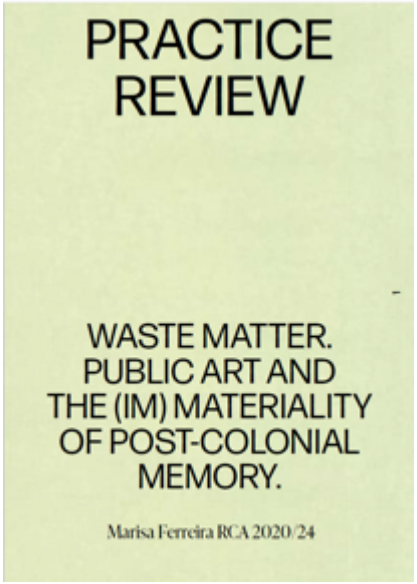
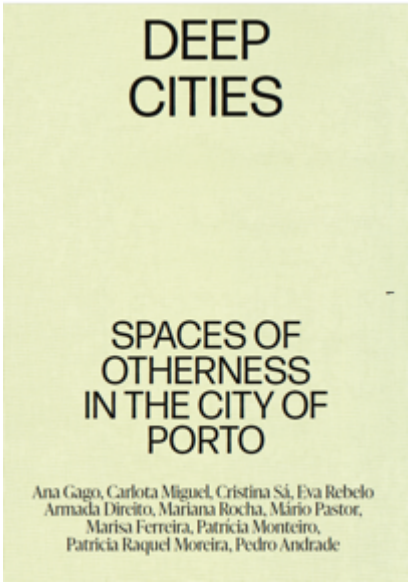
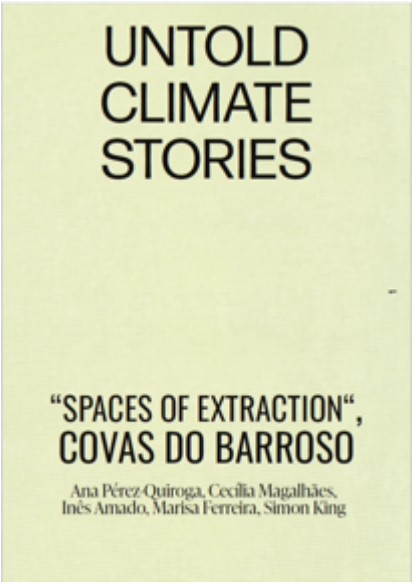
1] Practice Review, 2020-2024.
2] Booklet “Untold Climate Stories. Spaces of Extraction, Covas do Barroso”, 2023.
3] Booklet “Deep Cities - Spaces of Otherness in the city of Porto”, 2022.







ABSTRACT

Over the last century, the idea of progress and industrial capitalism have created a climate emergency through the violent extraction of natural resources. This research focuses on lithium mineral extraction taking place in Portugal and the consequences that these activities have for the environment and local communities.

Drawing from Robert Smithson's notion of 'ruins-in-reverse' and 'abstract geology', the research takes an interdisciplinary approach by combining geological, archaeological and forensic methods with the act of walking, site writing, object analysis and experimental practice to explore the area where fiction, imagination, and reality blur to reconstruct events through the geological layer and traces left by industrial development in places under extractive colonialism and popular resistance, economic dispute and ecological crisis. The research investigates the relation between waste and spatial justice within the contemporary context of globalisation. Working in sculpture, photography, and public art works, the practice explores the creative and subversive potential of waste to question the intersections between extractive capitalism, colonialism, the Anthropocene, and the climate crisis. Here I suggest that the ways we perceive and relate to waste are informed by the unjust geographies created by colonial legacies that are still present in the city order. The practice also includes the case study 'Kverndalen in New Light', in which I concentrate on methods, practices, and possibilities to reinscribe waste with meaning and value in order to propose speculative alternatives for urban regeneration projects in an effort towards material and spatial reconstitution.

The practice research draws from a range of theoretical perspectives and scholarly work to enable a conversation between different approaches to waste, unfolding the scope of their research, methodology and knowledge gaps. This travels from Michel de Certeau's work (1998) on the relationship between objects, memory and forgetting to explore alternative material forms of remembrance that acknowledges the 'transience' of power in the process of ruination (Desilvey, 2017), "waste as 'matter out of place'" (Douglas, 1966), Waste as 'matter out of time'" (Viney, 2014; Allon, Barcan & Edison-Cogan, 2021; Foucault's notion of "heterotopias" as 'spaces of otherness', Guttormsen's 'deep cities' framework, 2020), "waste value" (Thompson, 2017), and the use of 'ruin waste' (Edensor, 2005; DeSilvey, 2017) as an agent for 'radical change' (Franklin & Till, 2018); and Hawkins's 'waste as thing' (2018). The research looks at political ecology, decolonial theory, and urban

humanities (Bruna's 'green extractivism' (2022); Yusoff's 'white geology' (2018); Vergés 'racial Capitalocene' (2019); Cuff's "immanent speculation practice" (2020); Soja's "spatial justice" (2010); and Rendell's 'critical spatial practice' (2002). It also looks at contemporary artistic practices, specifically at Robert Smithson's work on entropy and Susan Schuppli's notion of 'material witness'.

Ultimately, I argue that waste can be understood as an alternative material form with value that has the potential to inspire social change and enable a more sustainable and inclusive ecological future. The research aims, therefore, to address and redefine the role of the artist in the urban policy-making of cities under transformation and industrial development.

Keywords: waste, entropy, space, justice, climate crisis, extractivism

INTRODUCTION

Waste Matter:
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> *The yet to be disposed of objects in ruins have been identified as 'waste', an assignation which testifies to the power of some to normatively order the world, but also is part of an excess, impossible to totally erase, which contains rich potential for reinterpretation and reuse because it is under-determined.*
>
> — Tim Edensor, 2005[1]

I. Overview

This research critically examines the complex relationship between waste and spatial justice through both practice and written thesis to investigate ways to reimagine waste as a valuable resource within urban settings. I argue that reimagining waste is essential for developing a vision of progress that cares for the planet, acknowledges all forms of life, and advances spatial and environmental justice given the unequal geographies and environmental issues produced by the trade in global waste and waste dumping. I explore possibilities to reimagine waste matter as a resource for inclusive artistic expression by examining how waste might be incorporated into urban settings in transformative ways. I set out to theorise waste as a material trace of power relations and global inequalities ('waste as racial') and I demonstrate that waste holds a subversive potential to foster social change by proposing 'otherness' as a creative framework. I propose ways to reinscribe waste value in order to develop methods and speculative alternatives for urban planning projects in an effort to achieve material and spatial reconstitution. Throughout the thesis, I highlight the creative and transformative possibilities of waste to challenge established urban planning paradigms and I discuss the need to create new public art policies that will contribute to creating a more sustainable, just, empathetic, and equitable urban future. I do this by framing waste as a resource, and by speculating about a future in which waste is reused, recycled, repurposed, and valued as a crucial element in reshaping

[1] Tim Edensor, 'Waste Matter – the Debris of Industrial Ruins and the Disordering of the Material World', *Journal of Material Culture*, 10.3 (2005), pp. 311-332, doi: 10.1177/1359183505057346

urban landscapes. This process of imaginative and speculative thinking emphasises the role of practice research in producing knowledge by doing, with the capacity to transform the human understanding of, and relationship with, waste and spatial justice.

Waste as a medium for challenging social inequality has received little attention, due to its perception as ‘marginal’ and ‘disposable’, and therefore ‘under-determined’ in urban development. Therefore, the primary goal of the research is to investigate how we perceive and relate to waste and how waste can question historical truths. The thesis addresses this gap by proposing ‘otherness as a creative framework’ to challenge spatial injustice and the linear perception of waste-value and to reinterpret the subversive potential of waste as described by Edensor, as a valuable resource for urban transformation. By employing waste as a material to reimagine otherness and spatial justice, the thesis challenges the structures that maintain spatial inequality by questioning linear conceptions of waste-value and disposability. Through theoretical and practice-led methodologies, I explore otherness to offer critical and creative approaches that theorise the ‘materiality of waste as racial’.

To outline my use of the term ‘otherness’, and its scope, I investigate how waste intersects with broader systems of power and inequality and how waste, ‘racial capitalism’, colonialism, and the Anthropocene intersect in the construction of ‘the other’. To do this, I examine ways in which Western culture has identified waste as ‘the other’[2] to investigate how we conceptualise waste, and how waste, space and time are entangled with some level of erasure, dispossession, exploitation, destruction, and unequal risk[3] that creates ‘wasted people and wasted places’.[4] (Chapters 2 and 4) I critically explore the intersection of waste and power by examining the social, political and environmental impact of extractive practices in Covas do Barroso (lithium mining) and toxic legacies in Langøya (limestone quarrying and toxic waste dumping). As I discover this, I understand waste as a trace (or as ‘material witness’, as Schuppli observes) of power relations, racial capitalism, and colonial exploitation (Vergès’s ‘Racial Capitalocene’, Yusoff’s ‘white geology’, and Gómez-Barris’s ‘colonial Anthropocene’). I propose the materiality of waste as racial to

[2] Susan Signe Morrison, *Waste Aesthetics: Form as Restitution. Interdisciplinary Studies in Literature and Environment* (Oxford University Press, 2013), p. 1.
[3] Ulrich Beck, quoted in Deborah Lupton, *Risk* (Routledge, 1999), p. 70.
[4] Marco Armiero, *Wasteocene. Stories from the Global Dump*, Elements in Environmental Humanities (Cambridge University Press, 2021), pp. 10-11.

acknowledge that the perception of waste is shaped by 'practices of othering' and 'wasting practices' that discard people and places.[5]

I will address Thompson´s notion of 'value as a mutable social relation' to instead explore ways to shift our perception of waste as valueless to one that sees it as 'durable',[6] both to define the function of disposability as a heritage concept in urban planning – by showing that the creation of global and sustainable cities is related to racialised forms of displacement, dispossession, spatial and social injustice and violence[7] – and to speculate on alternative material futures. Understanding that value is not an intrinsic characteristic of objects leads me to investigate how the experience of otherness might be reimagined. I acknowledge waste as 'transient matter' open to reconstitution[8] and follow Hawkins' suggestion of 'waste as things'.[9] This process reframes waste-value by highlighting its potential to inspire social transformation and change. I will examine the temporalities and subversive potential of waste in the city through Tim Edensor's work on 'ruin waste', and Torgrim Guttormsen's concept of the 'deep city'[10] to disrupt established hierarchies of value and position waste as a site of transformation with the potential to advance spatial justice. I propose 'places of disposal' as an addition to Guttormsen's identification of heterotopic features, to read deep time in the city in order to acknowledge the heritage value of waste geographies.

I then reframe otherness and explore ways to reinscribe waste with new meanings and values that demonstrate waste's transformative potential to enable both material and spatial reconstitution. (Case study 'Kverndalen in New Light', Chapter 5) I draw from Jane Bennett's concept of 'vibrant matter' to argue that waste should not be perceived as inert or 'dead matter', but as possessing an inherent 'vitality' that affects other bodies, either by amplifying or lessening their power[11] through an 'assemblage'.[12] I position waste as part of a shared system in which all entities have agency by considering that humans,

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[5] Ibid., pp. 9-10.
[6] Michael Thompson, *Rubbish Theory. The Creation and Destruction of Value* (Pluto Press, 2017), p. 4. Thompson suggests that the three categories of value are' transient', 'rubbish' and 'durable'.
[7] Ida Danewid, 'The Fire This Time: Grenfell, Racial Capitalism and the Urbanisation of Empire', *European Journal of International Relations*, 26.1 (2020), pp. 289–313, doi: 10.1177/1354066119858388
[8] Gay Hawkins, *The Ethics of Waste. How we Relate to Rubbish* (Rowman & Littlefield, 2006), p. 80.
[9] Ibid,, p. 73.
[10] Kalliopi Fouseki, Torgrim Guttormsen and Grete Swensen, *Heritage and Sustainable Urban Transformations: Deep Cities* (Routledge, 2020), p. 50.
[11] Jane Bennett, *Vibrant Matter: a Political Ecology of Things* (Duke University Press, (2010), pp. 11, 13. Bennett uses the term 'vitality' to describe a thing's ability to function as an agent or force with independent tendencies or trajectories, as described in the book's preface, p. viii.
[12] Ibid., p. 23.

non-humans, and material objects are in constant transformation through processes of 'contamination', as suggested by Anna L. Tsing,[13] and by demonstrating that waste matter can be displaced and transformed, but never erased (Chapter 4).[14] I then investigate how public art can challenge the ways we perceive and relate to waste to strive towards material and spatial reconstitution. I do this by drawing on Edward W. Soja's notion of social justice as spatial[15] and Gay Hawkins' work on the ethics of waste to shift our perception of waste as a social and environmental issue that creates unfair geographies towards waste as a 'thing', in order to explore new methods of art production that transform waste into highly valuable material. I also look at the work of the architectural theorist Dana Cuff on the practice of 'immanent speculation' within the urban humanities[16] as a way to link speculative discourses to imagination and ethics in order to foster spatial justice and to challenge the uneven geographies created by capitalist growth.

There are other approaches to otherness that the thesis does not cover, including Simone de Beauvoir's work on 'women as other'[17] and Gayatri Spivak on the subaltern.[18] My research focuses on material otherness to reimagine waste for social transformation, and therefore is more aligned with the creative and temporal dimensions of otherness (as Edensor and Guttormsen have discussed), rather than de Beauvoir's insights on 'gendered otherness' and the historical structures that have defined women's position as 'the other', or Spivak's work on the subaltern to discuss 'the production of the European Other'. My work focuses primarily on practices of othering in relation to the Anthropocene and extractive practices (as Vergés, Yusoff, Gómez-Barris and Beck discuss) and 'material otherness', including the ways in which waste is perceived (in Douglas, Viney, Thompson and Armiero), marginalized (in Bataille, Armiero, DeSilvey, Liboiron and Guttormsen), and reinscribed with value (in Thompson and Hawkins) to explore waste as a medium for material and spatial reconstitution.

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[13] Anna L. Tsing, *The Mushroom at the End of the World. On the Possibility of Life in Capitalist Ruins* (Princeton University Press, 2015), p. 27.
[14] Edensor, 'Waste Matter'; Joshua Reno, 'Your Trash is Someone's Treasure: The Politics of Value at a Michigan Landfill', *Journal of Material Culture*, 14.1 (2009), pp. 29-46, doi: 10.1177/1359183508100007
[15] Edward W. Soja, *Seeking Spatial Justice* (Minnesota University Press, 2010), p. 1.
[16] Dana Cuff and others, *Urban Humanities. New Practices for Reimagining the City* (The MIT Press, 2020), pp. 36, 175.
[17] De Beauvoir writes: 'He is the subject, he is the Absolute – she is the Other'. Simone de Beauvoir, *The Second Sex* (Lowe and Brydone, 1953), p.15.
[18] Gayatri Chakravorty Spivak, 'Can the Subaltern Speak?' in Cary Nelson and Lawrence Grossberg (eds.) *Marxism and the Interpretation of Culture* (Macmillan, 1988).

II. Methodology

Through experimental practice, case studies, photo essays, and SPACEX secondments,[19] I have employed 'speculative mapping' as a creative, exploratory, reflexive, and critical methodology to explore the complex nature of waste. This methodology has allowed me to combine scientific enquiry with artistic expression to offer new ways of engaging with landscapes that are often marginalised. It enables me to develop speculative possibilities for exploring otherness and reimagining waste-value in urban settings. As I discover waste as both a 'material witness'[20] and as a site for creative reinterpretation / transformation,[21] I challenge linear perceptions of waste and propose new ways of thinking about waste-value, waste-time, and the potential of waste to create alternative futures that can advance spatial justice.

I adopt speculative mapping that functions as both method and methodology during the research journey, and I frame it as a methodology that connects two purposes. First, as an interdisciplinary spatial analysis with a speculative framework for analysing complex landscapes, and second, as a creative method for reimagining the transformative potential of waste in urban settings. This dual and critical approach to waste landscapes enables me to suggest waste as an 'emergent alternative'[22] for urban planning in working towards material and spatial reconstitution.

The methodology draws from Forensic Architecture's 'sense-making' (waste as data) and Susan Schuppli's concept of material witness to examine the materiality of waste and its capacity to document past events, environmental changes, and social injustice in Covas do Barroso, a planned open-pit lithium mine in Portugal. I embrace the 'forensic imagination' that suggests that 'every contact leaves a trace'[23] as a guiding principle to explore how the materials 'speak'[24] and 'bear witness'.[25] I also draw on Jane Rendell's

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[19] 'Spatial Practices in Art and Architecture for Empathetic Exchange (SPACEX)', SPACEX, n.d. <www.spacex-rise.org/> [accessed 8 June 2025].
[20] Susan Schuppli, *Material Witness: Media, Forensics, Evidence* (The MIT Press, 2020)
[21] Edensor, 'Waste Matter'.
[22] Adrienne Maree Brown, *Emergent Strategy. Shaping Change, Changing Worlds* (AK Press,2017), p. 5.
[23] Schuppli, *Material Witness,* p. 9.
[24] Isabelle Stenger, a Belgian philosopher of science who has influenced Susan Schuppli´s notion of 'material witness', argues that researchers must accept the possibility that it is not the human but the material that asks the questions.
[25] Schuppli, *Material Witness,* p. 9.

work on 'critical spatial practices'[26] by using site-writing to examine the intersection between space, power dynamics, and justice, as well as Simon O'Sullivan and David Burrows' exploration of 'fictioning' as a creative and critical method for engaging with complex landscapes. I explore these concepts as a way to "fictioning the landscape"[27] through photography, material experiments, counter-mapping, site-writing, walking ('Notes on a Journey to Covas do Barroso', 2021*; '*Spaces of Otherness', 2023; 'Untold Climate Stories'*,* 2024), and object analysis under the microscope to produce knowledge through a process that blurs the real, the imaginative, and the fictional.[28] This interdisciplinary approach enables me to understand the power dynamics that are embedded in the landscape, and to acknowledge 'ruin waste' as 'silently active'[29] in the complex relationship between humans and nature.

I employ a geological[30] and archaeological imagination (in Renfrew and Shanks) to explore waste matter's capacity to register past / present / future events and make social injustices visible. Michael Shanks' method of 'archaeological imagination',[31] which addresses archaeology as a process of reflexivity,[32] has been central to my understanding of the creative role archaeology plays in digging, uncovering, analysing, and interpreting the material remnants of what has been left. I link this to Robert Smithson's work on 'abstract geology'[33] and 'sedimentation' to understand the relationship between mind and matter,

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[26] Jane Rendell draws from Michel de Certeau and Henri Lefebvre and links their writing with the critical theory of the Frankfurt School to suggest the usefulness of critical spatial practices in questioning and transforming the social norms and conditions of the site.

[27] Simon O'Sullivan, 'Fictioning the Landscape', *Journal of Aesthetics and Phenomenology*, 5.1 (2018), pp. 53-65, doi: 10.1080/20539320.2018.1460114. 'Fictioning the landscape' refers to the performance of blended narratives (real, imaginary, or fictional), often through a journey that highlights the complex ways in which spatial and temporal layers are enacted to involve both past and possible futures.

[28] Ibid.; Simon O'Sullivan, 'Mythopoesis, or Fiction as Mode of Existence: Three Case Studies from Contemporary Art', *Visual Culture in Britain*, 18.1 (2017), pp. 292-311, doi: 10.1080/14714787.2017.1355746.
O'Sullivan's idea of 'fictioning' as a performance blurs the reality/ fiction boundary.

[29] Başak Şenova, *Barbara Holub – Stiller Aktivismus/ Silent Activism* (University of Applied Arts Vienna; De Gruyter, 2022), pp. 12, 72-73.
Holub's idea of 'silent activism' refers primarily to the act of activating the hidden potential and qualities in people, while I am addressing it in relation to waste's material potential for enacting spatial justice.

[30] 'The Geological Imagination', *DM Journal: Architecture and Representation*, 1 (2023) <drawingmatter.org/journal/issues/dmj-21-architecture-and-the-geological-imagination> [accessed 8 June 2025]

[31] Michael Shanks, *The Archaeological Imagination* (Left Coast Press/Routledge, 2002).

[32]Although Shanks does not refer to his work as 'reflexive', by looking at the creative process of uncovering, analysing and interpreting it, he is addressing 'archaeology as a reflexivity process' that challenges the idea of the archaeologist as an entirely objective observer and acknowledges that their own cultural, theoretical, methodological, and personal perspectives shape the research process and the critical analysis of their own contribution to knowledge production.

[33] Etienne Turpin, 'Robert Smithson's Abstract Geology: Revisiting the Premonitory Politics of the Triassic', in Ellsworth, Elizabeth and Kruse, Jamie, *Making the Geologic Now* (Punctum Books, 2012), pp. 173-178, doi: 10.21983/P3.0014.1.29

sedimentation and transience – this area of research informs Chapters 2 and 3. Smithson's notion of integrating art with the geological ('abstract geology') enables me to investigate how waste intersects with broader systems of power and inequality by examining how the materiality of waste affects, and is affected by, its entanglement with humans, non-humans, and nature as part of a web of life (in Haraway, Tsing, Müller, Edensor, Armiero, Bennett).

I also examine the entangled relationship between humans and nature by looking at archival materials to trace the trajectory of change in Langøya, a former limestone quarry transformed into a site for the dumping of toxic waste in Oslo fjord, Norway. This research informs Chapter 4. I study Langøya to understand ways in which human agency has irreversibly changed the composition of the Earth's crust through activities of 'slow violence'[34] (Nixon) and timescales beyond the perceivable[35] (Beck) that impacts life on the planet (Armiero). This analysis strengthens my argument that waste materiality can challenge historical truths by demonstrating that the West's approach is often led by colonial legacies that separate humans from nature to justify the exploitation of its resources.[36] I suggest that the toxic legacies of Langøya reinforce hierarchies and systems of inequality embedded in narratives of progress and economic growth that justify resource extraction and environmental exploitation.

This leads me to explore waste as a resource for artistic expression to challenge the global inequality and injustice created by the geological agency of human activities.[37] I explore ways in which the mine tailings of Covas do Barroso can be repurposed through a series of works titled *Deep Wounds* (2022-) in which I develop a series of experimental prototypes, drawings, and small objects, drawing inspiration from archival engineering drawings of drilling technology. These were first exhibited in my solo exhibition 'An Archive of Evidence' at Hå Gamle Prestegård, Norway, together with drone photography of Covas do Barroso, to draw attention to the interconnections between extraction and the development of drilling and survey technology.

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[34] Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Harvard University Press, 2011). Nixon´s notion of 'slow violence' refers to the kinds of violence that result from industrial pollution, which are invisible and that take place gradually in low-income communities in the Global North and Global South.

[35] Ulrich Beck, *Risk Society* (London: Sage, 1992), p. 64.

[36] Max Liboiron, *Pollution is Colonialism* (Duke University Press, 2021). This idea is addressed in Chapter 1, 'Land, Nature, Resource, Property', in which Liboiron outlines 'the historical and conceptual foundations for the invention of modern environmental pollution as a colonial achievement'.

[37] Liana Chua and Hannah Fair, 'Anthropocene' [2023], in Felix Stein (ed.), *The Open Encyclopedia of Anthropology*, 2019, Facsimile of the first edition in *The Cambridge Encyclopedia of Anthropology*. <https://www.anthroencyclopedia.com/entry/anthropocene>, doi: 10.29164/19anthro

I also explore this idea of waste as a resource for artistic expression through a case study, 'Kverndalen in New Light', in Skien, Norway, for which I undertook a spatial analysis of the city to explore the materiality of waste as a critical medium for mobilising material and spatial reconstitution. Through the creation of two public art projects, *A Bigger Splash* and *Blue Bonds,* I investigate the artist's role in cities undergoing urban transformation and challenge the linear perception of waste by employing an exploratory and speculative approach to propose methods to transform waste into inclusive alternatives for urban planning. This involves reusing discarded materials (stones) in new urban settings (as pavement) and a series of material experiments and prototypes developed in collaboration with a polymer lab (Norner) and industrial partners (Plastinor, Oceanize) to explore methods for melting, reshaping, and repurposing different types of plastic through existing technologies that are normally used by other industries.

I further develop this line of enquiry into the material potential of waste to be reinterpreted[38] through an interdisciplinary walk, 'Spaces of Otherness – Deep Cities' (Catholic University of Porto - UCP, 2023) where I employ the 'deep cities' framework proposed by the Norwegian archaeologist Torgrim Guttormsen as a strategy for understanding the role of the archaeological enquiry to read change. I apply Guttormsen´s four concepts from his archaeological-theoretical 'deep cities' framework (dissolution, collage, palimpsest, and stratigraphy) and I observe that Guttormsen's framework does not account for the temporal spaces that waste occupies in the city as part of its heritage. I propose 'places of disposal' as heterotopic spaces with heritage value to acknowledge waste's capacity to reveal ongoing practices of othering taking place in the city's deep time. This allows me to acknowledge the temporalities of waste in the city as part of the urban landscape (beyond its geological layers) and to recognise waste as a mnemonic material that is capable of tracing change.

My engagement with the materiality of waste and its transformation into something that is durable[39] in the case study 'Kverndalen in New Light' (2020/21-), the walking project 'Spaces of Otherness, Deep Cities' (2023), and the series *Deep Wounds* (2022-) moves away from this idea of an irreversible process of decay.[40] Rather than seeing entropy as a

[38] Edensor, 'Waste Matter'.
[39] Thompson, *Rubbish Theory,* p. 4.
[40] Anya Novak, 'Broken Circle and Spiral Hill: Having Entropy the Dutch Way', Holt/Smithson Foundation, Scholarly Texts, Chapter 2 (2020) <holtsmithsonfoundation.org/broken-circle-and-spiral-hill-having-entropy-dutch-way> [accessed 15 March 2022]

measure of ‘disorder’, my practice addresses entropy as a creative force that generates new forms, materialisms, and possibilities, in order to rethink ‘waste as things’[41] (Hawkins) and to challenge the linear perception of waste as something to be disposed of. My practice suggests that entropy can lead to new approaches to city planning by reframing what is discarded as something that is durable,[42] as an attempt to address the potential of waste to foster spatial justice. This also implies that my role as an artist in search of spatial justice in urban space might include confronting unjust geographies in creative and innovative ways to imagine new materialisms that can transform our relations with the things we pretend not to see.

III. Thesis Structure

The argument unfolds in five chapters, in addition to the Introduction and Conclusion. The Introduction presents the research objectives, questions, methodology, and the structure of the thesis and acts as a preface for the thesis by positioning my use of the term ‘otherness’. I propose ‘otherness as a creative framework’ to challenge spatial injustice and to reinterpret the subversive potential of waste (Edensor) as a critical material for urban transformation.

In Chapter 1, ‘Waste and the Biopolitics of Disposability. On Waste Value, Practices of “Othering” and Spatial Justice’, I address waste through different theoretical perspectives drawn from the field of waste studies, political ecology, social sciences, decolonial theory, the environmental and urban humanities, and material culture to address knowledge gaps and methodologies that enable me to shift from waste as ecological destruction to waste as a valuable resource. This discussion lays the groundwork for the following chapters, that are built on these concepts to explore the creative potential of waste to advance spatial justice.

In Chapter 2, ‘Lithium Geographies. Towards a Political Understanding of the “White Gold” Landscape’, I propose that ‘ruin waste’[43] produces new knowledge with the capacity to trace urban transformation and explore different types of evidence to address issues

[41] Hawkins, *The Ethics of Waste*, p. 73.
[42] Thompson, *Rubbish Theory*, p.4. ‘Durable’ refers to one of Thompson’s three categories of value, alongside ‘transient’ and ‘rubbish’.
[43] Tim Edensor, *Industrial Ruins: Space, Aesthetics and Materiality* (Berg Publishers, 2005). Edensor refers to ‘material objects in ruins’ as ‘ruin waste’.

resulting from the ecological crisis, social justice, and inequality caused by the lithium mining industry. In Chapter 3, 'Extractive Practices. The (invisible) 'Debris of Violence'[44]. Extractivism, Colonial Geology and the Anthropocene', I revisit the discussion of the capacity of waste to produce knowledge of past events, and I follow the idea that the Anthropocene has its 'golden spike' in the long and ongoing history of colonialism in order to reinforce my overall argument for the urgency of reimagining the material potential of waste in fostering spatial justice.

In Chapter 4, 'Waste Geographies. On Waste Temporalities, Politics and Power', I shift from the geological debate to the lived experiences of people who live in, with, or around waste in order to examine how waste intersects with broader systems of power and inequality, and to explore waste as a 'flexible category rooted in social relations',[45] rather than just as a by-product of our desire to possess and accumulate things. I propose the materiality of *waste* as 'racial' to critically demonstrate that the uneven impact and harm of extractive practices and 'toxic heritage'[46] across geopolitical boundaries weighs heavily on the ways we perceive and relate to waste.

In Chapter 5, 'Waste Materiality. Reimagining Public Art, Urban Space & Spatial Justice. On the Politics of Waste Value', I explore ways to reinscribe waste with value by focusing on the importance of exploring waste's material potential to foster spatial justice and create more sustainable, just, and equitable futures. Through the case study 'Kverndalen in New Light' (2020-), I explore processes of reusing, recycling or repurposing waste through already existing technologies to mobilise material and spatial reconstitution.

In the Conclusion, I return to the objectives, methodology, practical, and theoretical approaches of the thesis to reflect on the main findings from the chapters. I put together

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[44] Gastón R. Gordillo, *Rubble: The Afterlife of Destruction* (Duke University Press, 2014), p. 185. Gordillo suggests that 'debris of violence' refers to the spatial and cultural sedimentation of a historical legacy of violence.

[45] Hawkins, *The Ethics of Waste,* pp. Viii-ix.

[46] Tsing and others' idea of the 'patchy Anthropocene' and Ulrich Beck's work suggests that the impact of the hazards created by the 'risk society' is uneven across geographical boundaries. Dean Curran, 'Beck's Creative Challenge to Class Analysis: from the Rejection of Class to the Discovery of Risk-class', *Journal of Risk Research*, 21.1 (2018), pp. 29-40 (p. 36), doi: 10.1080/13669877.2017.1351464, while Sarah May and Elizabeth Kryder-Reid address toxic heritage as a planetary phenomenon in the introduction to their book. Sarah May and Elizabeth Kryder-Reid, *Toxic Heritage. Legacies, Futures, and Environmental Injustice.* (Routledge, 2024), p. 2.
Anna L. Tsing, Andrew Mathews and Nils Bubandt, 'Patchy Anthropocene: Landscape Structure, Multispecies History, and the Retooling of Anthropology', *Current Anthropology*, 60(S20) (2019), pp. 186-197, doi: 10.1086/703391 [accessed: 14 November 2023].

the arguments in the thesis and emphasise the capacity of waste to both challenge historical truths and witness uneven power dynamics. I critically reflect on the research questions and methodologies employed during the research journey to examine waste and otherness / power / spatial justice through the case studies, SPACEX secondments, visual essays, and experimental practice. I reinforce the idea of the material potential of waste to record change and as a resource to advance spatial justice, and I also discuss the impact of conferences and academic activities to frame mapping as 'speculative mapping' in order to acknowledge the exploratory and speculative nature of my research; I propose 'otherness as a creative framework', in which I frame waste as a critical material to advance alternative futures.[47] I emphasise the creative and transformative possibilities of waste to challenge urban planning paradigms and I argue for the need for new public art policies that integrate waste into urban settings. I reflect on the contributions to knowledge, the limitations, and the impact of my research and I emphasise that the thesis is not trying to define sustainability or identify solutions to spatial justice, but rather explore the possibilities of addressing the material potential of waste to reorientate[48] urban transformations towards spatial justice as an attempt to enable both material and spatial reconstitution. I conclude by suggesting areas for future research within the scope of waste, spatial justice, and sustainability.

[47] Dana Cuff and others, *Urban Humanities. New Practices for Reimagining the City* (The MIT Press, 2020), p. 179.
[48] Andreas Philippopoulos-Mihalopoulos, *Spatial Justice: Body, Lawscape, Atmosphere.* Space, Materiality and the Normative (Routledge, 2015), p. 6.

CHAPTER 1

Theoretical Foundations

Waste and the Biopolitics of Disposability.

On Waste Value, Practices of "Othering" & Spatial Justice.

> *Waste offends us to the extent that it reflects back our own shortcomings, our failure to preserve value that we originally invested in an object [...] waste results from carelessness – that is from a neglect or failure to care for the things we have valued.*
>
> – Greg Kennedy, 2007:4-5[49]

Our daily engagement with waste matter does not necessarily mean we are familiar with it, because most systems of waste, including social, economic, political, cultural, and material systems that influence waste and wasting practices, are completely invisible from public observation and knowledge.[50] In this chapter I present the theoretical foundations of the thesis, which are built from several theoretical perspectives and the work of scholars from the social sciences, discard studies, political ecology, decolonial theory, the urban humanities, and material culture to enable a conversation between different approaches to waste, unfolding the research scope, methodology, and knowledge gaps in these. Michael Thompson's idea that waste value is a 'mutable social relation'[51] helps us shift from thinking of waste as an ecological disaster to seeing it as a resource. By doing so, we can better understand how artists and practice research can change how people perceive and engage with waste's materialities and offer critical alternatives in order to advance spatial justice.

The chapter is divided into two sections. 'Practices of Othering' introduces the idea of waste as matter out of both space[52] and time,[53] and draws from value as a mutable social

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[49] Greg Kennedy, *An Ontology of Trash: The Disposable and its Problematic Nature.* (State University of New York Press, 2007), pp. 4-5.
[50] 'On the Definition of Discard Studies', Discard Studies, n.d. <https://discardstudies.com/what-is-discard-studies/ > [accessed 8 June 2025]
[51] Michael Thompson, *Rubbish Theory. The Creation and Destruction of Value* (Pluto Press, 2017), p. 10.
[52] Mary Douglas, quoted in Fiona Allon, Ruth Barcan and Karma Edison-Cogan (eds.), *Temporalities of Waste. Out of Sight, Out of Time* (Routledge, 2021), p. 1.
[53] William Viney, *Waste. A Philosophy of Things* (Bloomsbury Publishing, 2015), p. 2.

relation[54] to explore the relationship between humans and their 'discards'. In addition, the section examines a set of considerations that explores the subversive, critical, and aesthetic potential of 'ruin waste'[55] for new artistic creation while placing the capitalist politics of ecology within colonial history and its racialised violence to investigate how waste intersects with broader systems of power and inequality. (in Vergès, Yusoff, Gómez-Barris) The section then examines how the extraction of ore and the dispossession of matter and bodies is entangled with the ways we perceive and relate to waste as 'the other'.[56] The section addresses the Anthropocene from Marco Armiero's perspective of the 'Wasteocene', and looks at Dunlap and Riquito's work on 'green extractivism'[57] in the Barroso landscape to observe the dissonances, exclusions, and erasures that contrast climate narratives with the stories of those who embody the impact of exploitation for global 'green' commodity markets. The section concludes by looking at Robert Smithson´s notion of 'abstract geology' to analyse what might constitute a critical aesthetic of material otherness capable of inspiring new forms of public art, where contemporary art, political ecology, and environmental humanities might intersect. The second section, 'Towards a Public Art Policy for Spatial Justice', reimagines the experience of otherness and addresses the potential of waste materiality to reorientate urban transformations towards spatial justice as an attempt to enable both material and spatial reconstitution. I draw from the geographer Edward W. Soja's notion of social justice as spatial[58] and from Gay Hawkins' work on the ethics of waste to shift our perception of waste as a social and an environmental issue towards waste as a resource to develop new methods of art production that transforms waste into valuable new materialisms that have the capacity to move us towards a more equitable, empathic, and sustainable future. The section then concludes by discussing the work of Dana Cuff on the practice of 'immanent speculation'[59] as a way to link speculative discourses to creative imagination and ethics.

Modernity is not often associated with ruins.[60] Yet in the middle of an intense process of industrialisation and urban population growth, the utopian idea of progress developed from

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[54] Thompson, *Rubbish Theory*, p. 10.
[55] Tim Edensor, *Industrial Ruins: Space, Aesthetics and Materiality* (Berg Publishers, 2005).
[56] Georges Bataille,*The Notion of Expenditure, Visions of Excess* (University of Minnesota Press, 2006).
[57] Alexander Dunlap and Mariana Riquito, 'Social Warfare for Lithium Extraction? Open-pit Lithium Mining, Counterinsurgency Tactics and Enforcing Green Extractivism in Northern Portugal', *Energy Research & Social Science* 95. 102912 (2023), pp. 1-21.
[58] Edward W. Soja, *Seeking Spatial Justice* (Minnesota University Press, 2010), p. 1.
[59] Dana Cuff and others, *Urban Humanities. New Practices for Reimagining the City* (The MIT Press, 2020), pp. 36, 175.
[60] Bjørnar Olsen and Þóra Pétursdóttir, *Ruin Memories: Materialities, Aesthetics and the Archaeology of the Recent Past* (London: Routledge, 2014).

the nineteenth century into a steep global capitalist search for profit, creating a climate emergency[61] that indicates how the Earth has been altered by industrialised civilisation in ways that are similar to processes of deep time.[62] I will examine ways in which Western culture has identified waste as 'the other' [63] to investigate how we conceptualise waste and value, how we perceive and relate to waste, and how waste, space, and time are entangled with some level of erasure, dispossession, exploitation, destruction, and unequal risk[64] in order to demonstrate that by shifting our perception from waste as an ecological issue to waste as a resource, waste can be turned into an art medium to imagine the future and to work towards spatial justice in urban planning (I explore this in Chapter 5, in the case study 'Kverndalen in New Light').

Rubble, trash, garbage, debris, junk, rubbish, litter, filth, and excrement all suggest the notion of 'waste'. Often witnessing and tracing industrialised civilisation, waste reveals how the modern approach to industrial production, accumulation, and the creation of surplus reflects the human relationship with the environment through uneven power relations. The thesis neither traces waste production and management historically nor includes current issues in waste production (wastes of melting ice and nuclear and toxic waste production) but rather focuses on the creative destruction of neoliberal capitalism, the 'ruins of modernity',[65] and the colonial production of the other to challenge our concept of waste and the way we perceive and experience the world of things. As Erik Post has argued, 'modes of extraction' supply the *energetic and material basis for* 'imperial modes of living'[66] and reflect how capitalism and economic globalisation, fuelled by Western consumption and technology, altered how people relate to waste. My research challenges this imperialist mode of living by making visible spatial injustices and by fostering a process of rethinking waste not just as an ecological problem, but also as a valuable material object through which we can develop new ways of living together in a more just and sustainable future.

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[61] Marisa Ferreira, 'Alternative Stories: The Ruins of Unbuilt Architecture as Fragments of "Waste Matter"' (unpublished MRes thesis, London: Royal College of Art, 2020), p. 8.
[62] David Farrier, David & Aeon, 'How the Concept of Deep Time Is Changing', *The Atlantic*, 31 October 2016, <https://www.theatlantic.com/science/archive/2016/10/aeon-deep-time/505922> [accessed 8 June 2025]. David Farrier is Professor of Literature and the Environment at the University of Edinburgh. His most recent books consider the new reality of the Anthropocene: *Anthropocene Poetics: Deep Time, Sacrifice Zones, and Extinction* (University of Minnesota Press, 2019).
[63] Susan Signe Morrison, *Waste Aesthetics: Form as Restitution.* Interdisciplinary Studies in Literature and Environment (Oxford University Press, 2013), p. 1.
[64] Ulrich Beck, quoted in Deborah Lupton, *Risk* (London: Routledge, 1999), p. 70.
[65] Julia Hell and Andreas Schönle, *Ruins of Modernity* (Duke University Press, 2010).
[66] Erik Post, 'Expanding Extractivisms: Extractivisms as Modes of Extraction Sustaining Imperial Modes of Living', *International Development Policy | Revue internationale de politique de développement,* '*The Afterlives of Extraction'*, 16 (2023), doi: 10.4000/poldev.5376.

I. *Practices of othering*

The production and disposal of waste is a cultural phenomenon, as it is shaped by social and cultural values and practices deeply marked by time (in Viney, Allon, Barcan & Edison-Cogan), space (Douglas), and notions of value (Thompson). In her 1966 book *Purity and Danger,* the anthropologist and cultural theorist Mary Douglas examines the cultural and social meanings of waste and argues that dirt is 'matter out of place',[67] and 'essentially disorder'.[68] If dirt is not inherent to the object but rather relates to where the object is placed, as Douglas suggests, then this spatial understanding of waste addresses the value of objects as a by-product of a system of order.[69] By analysing the way we keep or discard objects of our everyday life, we understand that our relation with waste is strongly marked by time as well as by space, as initially suggested by William Viney in his book *Waste: a Philosophy of Things*. Viney notes that 'experiencing waste both makes and marks time'.[70] He observes that waste is 'matter out of time',[71] and is therefore grounded in temporality. This prompts us to think about the effects of temporality on matter and materials, as well as the capacity of some materials to produce time, as suggested by both Tim Ingold and Gay Hawkins.[72] Thinking about or thinking from materials highlights the interactions between the historicity of materiality and social lives and the ways in which materials form, and in which meanings are constantly changing through their new temporal relations (ageing, location, etc), or their 'temporal ontologies', as suggested by Hawkins.[73] These dynamics of circulation, recontextualisation, or exchange, in which materials change, is not the same as material liveness[74] – the liveness of materials, Hawkins says, highlights how materials are 'of time'.[75] This means that waste has multiple readings and is perceived differently by different societies depending on their cultural and historical context.

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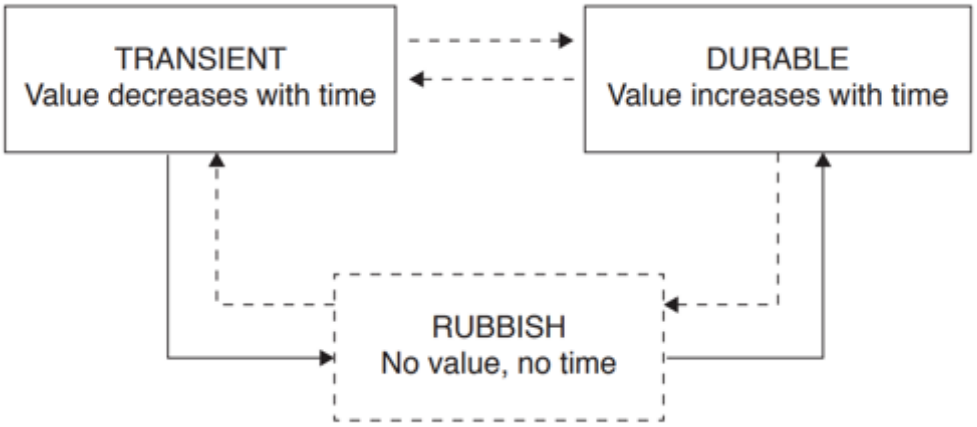
[67] Mary Douglas, quoted in William Viney, *Waste. A Philosophy of Things* (Bloomsbury Publishing, 2015), p. 111.
[68] Mary Douglas, quoted in Allon, Barcan & Edison-Cogan, *Temporalities of Waste,* p. 1.
[69] Ibid., pp. 2, 111.
[70] Viney, *Waste: A Philosophy of Things,* p. 24.
[71] Ibid., p. 2.
[72] Tim Ingold, "Toward an Ecology of Materials." *Annual Review of Anthropology*, 41,(2012), pp. 427-442, (p. 439), doi: 10.1146/annurev-anthro-081309-145920, 'Materials are not in time; they are the stuff of time itself'. Gay Hawkins, 'Plastic and Presentism: The Time of Disposability', *Journal of Contemporary Archaeology* 5.1, (2018), pp. 91–102, doi: 10.1558/jca.33291 'Materials are simultaneously in and of time'.
[73] Hawkins, 'Plastic and Presentism', p. 91.
[74] The term 'liveliness' alludes to Gilles Deleuze and Félix Guatarri's work regarding matter-movement or matter-energy, which holds that materials are always changing as they join and exit assemblages.
[75] Hawkins, 'Plastic and Presentism', p. 93.

Thompson´s theory of waste, first published as a PhD thesis under Douglas's supervision in 1979 and reedited in 2017, suggests also that value is not natural or inherent in things, but is a 'mutable social relation',[76] shaped by cultural values and practices. By examining cultural theory, he understands that the dynamic and ever-changing social system shows that the creation of value implies at the same time the creation of non-value.[77] To explain these value shifts, Thompson considers a review of his book by the mathematician Ian Stewart in 1979,[78] in which Stewart explains that social economists have long differentiated between objects as either 'transient' or 'durable', meaning that when one value decreases to zero (a finite lifespan), the other increases to infinity (an infinite lifespan).[79] This enabled Thompson to argue that in addition to the two categories of value – transient (here today, gone tomorrow) and durable (a joy forever)[80]— described by Stewart in his review, there is a third category of value, 'rubbish', which has zero value in socio-economic theory but which, according to him, provides the transition between transience and durability, because without this category of rubbish no transfers would be possible, as it is not possible to move from plus to minus, or vice versa, without passing zero.

Diagram 1. The Rubbish Theory Hypothesis developed by Michael Thompson.[81]



By introducing the category of 'waste value' (rubbish), Thompson highlights the importance of an understanding of the social and cultural dynamics of waste[82] to the material potential

[76] Thompson, *Rubbish Theory,* p. 10.
[77] Ibid., p. 3.
[78] Ian Stewart (1945-) is a British mathematician, best known for his contributions on catastrophe theory.
[79] Thompson, *Rubbish Theory,* p. 4.
[80] Ibid.
[81] Ibid.
[82] The Norwegian anthropologist Thomas Hylland Eriksen suggests 'waste as a by-product of consumption and production' that is often hidden from view. Thomas Hylland Eriksen, 'Waste is a Property of the Human Mind*',* Waste Society, n.d.*,* p. 1,

of waste as a valuable resource. Waste is not going away, so we need to learn how to 'stay with the trouble'[83] and build a more just, equitable and sustainable future. As suggested by John Scanlan, the emergency of a sustainability agenda that affects everything, from international politics to the creation of 'green' commodities and energy-saving technology, also shapes our perception of waste.[84] We might want to move away from the representation of the future in terms of ruin, depletion, pollution, and decline, as these scenarios are often seen as a manifestation of the destructive relationship between modernity and the environment; but what if we shift our perception and acknowledge the multiple temporalities of waste – not only as destruction, but also for the creation of value? By suggesting that value transfers from one category to another, and if this boundary between waste and value changes, as noted by Thomas Hylland Eriksen,[85] then it becomes crucial to look at waste through a forensic dialectic[86] in order to analyse the complex relationships between waste, society, power, and the city in order to understand why some people and places are seen as valuable and others as worthless.

'Wastescapes' trigger an awareness of our individual and collective responsibility towards the environment, as they are often described as having a negative impact on places and people, but these repercussions may not be mere spectres of past failures; as Tim Edensor suggests, they are spaces that multiply the readings of the city.[87] In *Industrial Ruins: Space, Materiality and Aesthetics*, Edensor argues that ruins are non-regulated spaces that accommodate marginalised and playful activities that contrast with the aesthetically and socially ordered spaces of the city.[88] He focuses on the universal qualities of ruins, rather than their contexts and geographies, to explore the ways in which

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<wastesociety.files.wordpress.com/2021/11/eriksen_waste-is-a-property-of-human-mind.pdf> [accessed 8 June 2025]

[83] Learning how to manage and rethink waste (the by-product of consumption) in a way that allows us to build a liveable future draws from Donna Haraway, *Staying with the Trouble. Making Kin in the Chthulucene* (Duke University Press, 2016).

[84] John Scanlan and John F.M. Clark, *Aesthetic Fatigue: Modernity and the Language of Waste* (Cambridge Scholars Publishing, 2013).

[85] 'It is true that the boundary between waste and value changes'. Eriksen, 'Waste is a Property of the Human Mind*',* p. 2.

[86] By forensic dialectic, I mean the process of examining and questioning opposing perspectives, in order to understand the underlying power dynamics and social relations at stake. The idea of contrasting the two opposing perspectives draws from Rodney Harrison's archaeological framework of shared quotidian experiences between 'the colonised' and 'the coloniser'. Rodney Harrison, 'Shared Histories: Rethinking "Colonized" and "Colonizer"', in Neal Ferris, Rodney Harrison and Michael V. Wilcox (eds.), *Rethinking Colonial Pasts through Archaeology* (Oxford University Press, 2014), pp. 37–56, doi: 10.1093/acprof:osobl/9780199696697.003.0002

[87] Henri Lefebvre, *Writings on Cities*. (Blackwell, 1996), p. 159.
Lefebvre stated that 'the most important thing is to multiply the readings of the city'; he is also quoted by Edensor, 2005.

[88] Ferreira, Alternative Stories', p. 8.

these abandoned buildings are appropriated[89] through a process of decay and non-human intervention.[90] Edensor observes that material objects in ruins ('ruin waste') go through a process of transformation in which they acquire alternative aesthetic properties that engage viewers in a multi-sensory experience.[91] Structural incompleteness, or 'fragmentary forms',[92] plays an active role in the interpretative process and imaginative engagement with ruins in which things may gain, rather than lose, meaning,[93] Edensor and Christopher Woodward[94] both draw on Freud's theories of loss and transience to examine the relevance of materiality expressed as transience.[95]

In *Heritage and Sustainable Urban Transformations* (2020), which I encountered in my research on Foucault's idea of heterotopias as 'spaces of otherness', the Norwegian archaeologist Torgrim Guttormsen proposes the idea of 'deep cities' as a strategy for combining a complete understanding of the past with the present and the future. In the book's introductory text Guttormsen suggests the term 'deep cities' to establish a language and a framework that addresses 'change' as value, in which destruction acts as a creative force that allows the blending of the old and the new to create new forms, allowing us to see the city as the result of both continuity and change.[96] Guttormsen's theory of the 'deep city' draws from the distinction made by the urbanist and architect Karl Otto Ellefsen between heritage management strategies of 'material protection' (the image of a specific time) and 'narrative protection' (depth of time and urban change as heritage values) to define two conceptual frameworks for valuing urban heritage – 'architectural' (the city as a homogeneous historical image) and 'archaeological' (the city as heterogeneous historical traces) – that enable him to develop an archaeological-theoretical approach that focuses on depth of time and urban change. In that sense, ruins, rubbish, junk, debris, and trash are heritage,[97] and therefore their traces can be used as a valuable resource in the present.

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[89] Caitlin DeSilvey and Tim Edensor, (2013) 'Reckoning with Ruins', *Progress in Human Geography*, 37.4 (2013), pp. 465-485, doi: 10.1177/03091325124622
[90] Ferreira, 'Alternative Stories', p. 8.
[91] Ibid., p. 8.
[92] Mats Burström, 'Looking into the Recent Past: Extending and Exploring the Field of Archaeology;, *Current Swedish Archaeology,* 16.1 (2009), pp. 21–36 (p.28), doi: 10.37718/CSA.2008.02. [accessed: 20 July 2022]
[93] Caitlin DeSilvey, *Curated Decay. Heritage beyond Saving* (University of Minnesota Press, 2017).
[94] Christopher Woodward, *In Ruins: A Journey Through History, Art, and Literature* (Vintage, 2003), p. 8.
[95] Ferreira,' Alternative Stories', p. 8.
[96] Kalliopi Fouseki, Torgrim Guttormsen and Grete Swensen, *Heritage and Sustainable Urban Transformations: Deep Cities.* (Routledge, 2020), pp. 7-8.
[97] UNESCO defines 'heritage' as 'the cultural legacy which we receive from the past, which we live in the present and which we will pass on to future generations'. 'World Heritage', UNESCO https://www.unesco.org/en/world-heritage [accessed 8 June 2025]

By approaching archaeology not only as an excavation practice but more importantly as a way of thinking and reflecting about the past,[98] Guttormsen suggests that urban planning needs to make use of the information gained from describing, appreciating, and understanding deep urban heritage. He integrates temporal traces into the cityscape by using Foucault´s six principles for identifying heterotopic places[99] and distinguishes them with four archaeological conceptualisations of urban heritage values: 'dissolution', 'collage', 'palimpsest', and 'stratigraphy'.[100] These four concepts are intended to be the basis for disseminating narratives and engage us in different ways to implement time and temporality in future sustainable cities.[101]

Originally identified by the ecologist Eugene Stoermer and the chemist Paul Crutzen in the 1980s, the Anthropocene is a geological epoch that acknowledges human planetary force[102] on the Earth's crust through mining, construction, and deforestation activities.[103] The concept builds on the influence that humans have on the environment, in the context of a growing concern about species extinction, climate change, and ecological crises.[104] During his Nobel Prize acceptance speech in 2002, Paul Crutzen referred to the Anthropocene to highlight the role of humans in a new geological epoch. He considered how the Industrial Revolution has led to high consumption of fossil fuels and how the resulting emissions of gases marked a threshold in human geological impact on the planet.[105] Debates over the ontological relevance, and the theoretical and practical challenges, of living in the Anthropocene'[106] have been ongoing in the work of various scholars. However, determining a 'golden spike' – the origin of the Anthropocene – is still

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[98] Fouseki, Guttormsen, and Swensen, *Heritage and Sustainable Urban Transformations,* p. 35.
[99] Ibid., p. 39. The concept of heterotopic places originates from Michael Foucault's essay 'Of Other Spaces', 1967. Published in English as 'Of Other Spaces', trans. Jay Miskowiec, *Diacritics*, 16.1 (1986), pp. 22-27.
[100] Fouseki, Guttormsen and Swensen, *Heritage and Sustainable Urban Transformations,* p. 50. Table 1, Chapter 5 of this thesis, p.130, offers an understanding of the differences between the four archaeological concepts that I and Guttormsen propose.
[101] In Chapter 5, I demonstrate that the experience of 'otherness' through waste and wasting practices leaves traces that account for the temporality of the city's archaeological layers and I recognise them as a heritage value ('places of disposal'). The creative and subversive potential of ruin waste (Edensor, 2005) seem to be in its fragmentary nature or "ongoing transformation" (Burström, 2009) and fluid state of material becoming (Edensor, 2005) . These spatial arrangements often lead to social and political exclusions, because waste, according to Georges Bataille (2006), is the 'other' in a capitalist society being rarely identified with notions of value and profit, and therefore, disposable. (This work further develops the research conducted for my Master's of Research Thesis at the Royal College of Art, 2019-2020.)
[102] Richard Grusin, *Anthropocene Feminism* (University of Minnesota Press, 2017) p. ix.
[103] Ibid, p.xiv.
[104] Janae Davis and others, 'Anthropocene, Capitalocene, Plantationocene?: A Manifesto for Ecological Justice in an Age of Global Crises', *Geography Compass*, 13.5 (2019), p.1, doi: 10.1111/gec3.12438.
[105] Joy McCorriston and Julie Field, *Anthropocene : a New Introduction to World Prehistory* (Thames & Hudson, 2010).
[106] John Kress and Jeffrey Stine, *Living in the Anthropocene: Earth in the Age of Humans* (Smithsonian Books, 2017).

an ongoing debate. In the context of the Anthropocene, I investigate how waste enables us to trace human activities as it mixes with humans, non-humans, and places, mutually transforming or coming together,[107] and how waste and time might be entangled with some level of erasure, dispossession, exploitation, and destruction. In Chapter 3, I discuss the practice of othering by looking at the intersection between colonialism and the Anthropocene to explore waste not as a 'thing' but as a collection of socio-ecological relationships that result in displacement, exclusion, and inequality, and thus in the creation of 'wasted' humans / non-human beings.[108]

Several scholars identify colonialism and capitalism as the causes that brought this epoch shift and argue that the ecological crisis is the result of practices of violence, exploitation, and consumption by a small part of humanity. Françoise Vergès introduced the term 'racial Capitalocene' to emphasise the different ways in which settler colonialism, slavery, and the use of the colour line led to a contemporary depreciation of human life and the non-human world,[109] while Kathryn Yusoff indicates that geology is essential to the crisis we now aim to define. In *A Billion Black Anthropocenes or None*, Yusoff questions the role of geology in the construction of human and non-human matter to reimagine the relationship of humans to geology. Yusoff´s notion of 'white geology' returns us to Lyell´s seminal book *The Principles of Geology*:[110] Yusoff uses geological terminology to define the position of race in relation to time in the same way as Lyell does in his geological theory defining 'the stratification of rocks formations and species in time',[111] to argue that geology and racial positioning are entangled. Here, Lyell and Yusoff share similar approaches to race by suggesting Blackness as being delayed in time[112] – as Achille Mbembe indicates, it is 'trapped in a lesser form of being'[113] and therefore rendered as inhuman.[114] It could have been at this particular moment, when race, time, and geology intersect, that the new epoch emerged out of the historical time, as it also marked the point at which geology appeared connected to extractive practices that turn the inert world into global commodities.

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[107] Joshua Reno, (2015) 'Waste and Waste Management', *Annual Review of Anthropology*, 44 (2015), 557-572 (p. 557), doi: orb.binghamton.edu/anthropology_fac/1.
[108] Marco Armiero, *Wasteocene. Stories from the Global Dump.* Elements in Environmental Humanities. (Cambridge University Press, 2021), pp. 10-11.
[109]Françoise Vergès, 'Capitalocene, Waste, Race, and Gender', E-*flux journal* 100 (May 2019). <www.e-flux.com/journal/100/269165/capitalocene-waste-race-and-gender/> [accessed: 18 February 2022].
[110] Kathryn Yusoff, *A Billion Black Anthropocenes or None* (University of Minnesota Press, 2018), pp. 74-85.
[111] Ibid., p. 74.
[112] 'Lyell's comments reveal the affective infrastructure that travels under scientific reason that privileges white comfort ('anxiety') over Black pain.' Ibid., pp. 76-79.
[113] Achille Mbembe, *Critique of Black Reason* (Duke University Press, 2017), p. 17.
[114] Yusoff, *A Billion Black Anthropocenes*, p. 76.

Originally developed by Latin American scholars and civil society, the concept of extractivism was created to explore oil conflicts in the 2000s.[115] Extractivism has since then been applied to diverse extractive sectors and regions and driven by the demands of global capitalism. It often refers to the removal of geologically valuable resources from the Earth's crust, through the exploitation, dispossession, and displacement of marginalised bodies and natural resources that are transformed into capital.[116] Extractive frameworks can lead to socio-ecological destruction and human geological agency in biological lifeworlds and spatial, social, and economic inequality, and therefore we need to recognise the ways in which the extraction of ore is interconnected with the way extractive territories and urban spaces function, where some groups or individuals are marginalised, exploited, displaced, or excluded from access to cleaner air, resources, wealth, and opportunities. The impact of extractive practices on the environment and affected communities, in addition to the COVID-19 pandemic, shows us the pressing need for change for the wellbeing of the entire living order.[117] For me, this entails placing more emphasis on my own responsibility as an artist, the need to re-evaluate my own relationship with the natural world, and the pressing need to move away from neo-liberal sustainable development in favour of a more just approach to resource management and ecologically sustainable alternative ways of seeing, being, knowing, and caring, as suggested by Kotzé and Adelman.

Understanding that environmental risks and destruction are formed discursively and socially,[118] and that environmental risks and the burdens of contemporary capitalist accumulation are unequally distributed,[119] I examine who is involved in extractive activities taking place in Barroso, who benefits or suffers from the creation and destruction of our environment, and how this is reshaping the entire Barroso region. Building on Bauman's concept of 'wasted lives', the Wasteocene, as Marco Armiero suggests,[120] frames waste

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[115] Alberto Acosta, 'Extractivism and Neoextractivism: Two Sides of the Same Curse', in M. Lang and D. Mokrani (eds.), *Beyond Development: Alternative Visions from Latin America* (Transnational Institute, 2013), pp. 61–86.
[116] Yusoff, *A Billion Black Anthropocenes,* p. 3.
[117] L.J. Kotzé and S. Adelman, 'Environmental Law and the Unsustainability of Sustainable Development: A Tale of Disenchantment and of Hope', *Law Critique* 34, pp. 227-248 (2023), doi: 10.1007/s10978-022-09323-4. [accessed 6 April 2023]
[118] 'In traditional societies, myths provide explanations for natural phenomena, facilitate individual and collective decisions, and give meaning and coherence to life. As people act on their myths, their societies and the natural environment are shaped and co-evolve around them', G. Kallis, J. Martinez-Alier and R.B. Norgaard, 'Paper Assets, Real Debts: An Ecological-economic Exploration of the Global Economic Crisis', *Critical Perspectives on International Business*, 5.1/2 (2009), pp. 14-25 (pp.18-19), doi: 10.1108/17422040910938659
[119] Ulrich Beck, quoted in Deborah Lupton, (1999) *Risk* (Routledge, 1999), p. 70.
[120] Armiero, *Wasteocene*.

as wasting, a social-ecological relation that creates ‘wasted people’ and ‘wasted places’; I focus on the political ecology of extractivism, originally created in the 1970s and 1980s to incorporate political economic forces into an understanding of environmental change and to reveal relations of power and dominance in the environmental crisis and the appropriation of nature.[121] My research examines how power relations and distribution issues shape environmental knowledge, and how social, cultural, and political differences shape the interactions between the environment and the human and non-human livelihoods under the global shift to ‘green’ commodities.

In her study of Mozambique's climate change policy, Natasha Bruna suggests ‘green extractivism’[122] as a novel version of extractivism that ushers in new waves of exploitation and appropriation of life, a logic of the commodification of nature[123] and capital accumulation through ‘green’ investments and projects directly linked to the fight against climate change. Bruna’s research demonstrates that the development of new commodities, vehicles for accumulation, and legitimation techniques lead to the emergence of new capital accumulation tactics,[124] normalised through today's focus on lowering emissions, in which countries in both the Global South and Global North are put under pressure to satisfy the demand for minerals and raw materials for green growth in a global transition to renewable energy. Bruna’s study demonstrates that green policies imply resource-grabbing, extracting, and expropriating emission rights while reducing essential consumption by people in poverty, and promoting external capital accumulation with negative effects on extractive regions.

Alexander Dunlap and Mariana Riquito further develop the idea of green extractivism and its interconnectedness to climate mitigation and a green economic progress agenda by looking at the intersection of mining, the green economy, and climate change to analyse how open-pit lithium mines in Europe are justified. They ground their study in the creation of the Mina do Barroso (Barroso Mine) in Portugal to argue that current European environmental policy is intensifying a ‘socio-ecological catastrophe’ that seems far more

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[121] Bettina Engels and Kristina Dietz, *Contested Extractivism, Society and the State. Struggles over Mining and Land* (Palgrave Macmillan, 2017), pp. 6-7.
[122] Natasha Bruna, ‘A Climate-smart World and the Rise of Green Extractivism’, *The Journal of Peasant Studies*, 49.4 (2022), pp. 839–864 (p. 854), doi: 10.1080/03066150.2022.2070482.
[123] Anna J. Willow, *Understanding ExtrACTIVISM: Culture and Power in Nature Resource Disputes* (New York: Routledge, 2018).
[124] Bruna, ‘A climate-smart world’, p. 853. For more on Natasha Bruna’s work on ‘green extractivism’ see Natasha Bruna, *The Rise of Green Extractivism. Extractivism, Rural Livelihoods and Accumulation in a Climate-Smart World.* (London: Routledge, 2023).

important than preserving the ‘socio-agro-ecological traditions’ of Barroso.[125] Dunlap and Riquito draw our attention to the strategies of the Portuguese government in 2018 to attract foreign investment without focusing on the interests of local people in the lithium-rich central and northern areas,[126] and describe the ways in which Savannah Resources camouflaged their prospecting activities and real intentions in Barroso by approaching the local communities as if the mining project was intended to produce materials for ceramics and glassware production.[127] They explain how the community's understanding of the future impact of lithium mining in the region led to a shift from prospecting activities being permitted free of charge to Savannah’s activities being continually blocked. This is something that testifies to an increased resistance to Savannah’s plans from local communities and municipal authorities, which I also learned about during my SPACEX secondment in March 2024, where I was introduced to the unequal balance of power and the coercive methods[128] Savannah Resources used to get access and expand the area of intervention in Covas do Barroso. There has been a clear intention to normalise extractive practices in the region through the media, event sponsorships, and the creation of an information centre in the village[129] to justify sustainable development, while also weakening the local community’s power in order to prevent opposition and allow the extraction of lithium. According to Dunlap and Riquito, European environmental policies that promote the extraction of critical raw materials neither promote socio-ecological sustainability nor mitigate the effects of climate change.[130]

German sociologist Ulrich Beck’s theory of risk acknowledges that ‘all societies in human history have been subject to threats of health and life’ (a ‘risk society’) but distinguishes the global nature of hazards in contemporary societies from those in previous eras, due to environmental problems that are becoming harder to quantify, prevent and avoid.[131] He argues that contemporary hazards are no longer viewed as a supernatural concept beyond the control of humans, and thus incalculable, but are perceived to have emerged from

[125] Alexander Dunlap and Mariana Riquito, ‘Social Warfare for Lithium Extraction? Open-pit lithium Mining, Counterinsurgency Tactics and Enforcing Green Extractivism in Northern Portugal’, *Energy Research & Social Science* 95. 102912, (2023), pp. 1-21 (p. 18).
[126] Ibid., p. 2.
[127] Ibid., p. 9.
[128] Ibid., p. 10. Locals were made to agree to the prospecting activities under threat of being forced to accept it.
[129] I never encountered the information centre open in the four field trips I made to Covas do Barroso between 2021 and 2024.
[130] Dunlap and Riquito, ‘Social Warfare for Lithium Extraction?’, p. 18.
[131] Ulrich Beck, *Risk Society: Toward a New Modernity* (London: Sage, 1992), p. 64.

processes of modernisation and globalisation linked to human responsibility and political decisions.[132] How to manage risk is thus shaped by power relations and social values. Beck highlights the ways that contemporary societies are characterised by the production and management of risk by recognising that industrial modes of production and environmental risk had become a manageable side-effect of 'industrial society'[133] and although the risks and hazards in the early days of industrialisation were perceptible to the senses in everyday experiences (they could be observed, smelled, tasted, and touched), many of the major risks nowadays are 'invisible'[134] to human perception and exist only in scientific knowledge. He argues that this distribution of environmental risk is uneven as a result of broader social and economic injustices: marginalised and poor communities are the most vulnerable and bear the brunt of environmental destruction. Beck acknowledges that some social groups are more affected than others by industrial pollution and climate change by observing the 'growing inequalities in risk distribution' where former colonies of the Western world are becoming the waste dumps of the world.[135]

Beck's analysis helps us to understand that developing countries and the least privileged communities are those who are more affected by the side-effects of global geopolitics and where resources have been most depleted. Beck suggests that it becomes vital to mitigate this knowledge gap (the lack of a subjective perception of risk) by making visible the 'self-destructive potential' of the 'risk society'.[136] Therefore, the practice research developed in Covas do Barroso, which combines geological and archaeological imagination[137] with forensics, walking, site writing,[138] and object analysis to make the social-ecological destruction of lithium mining in Barroso visible, explores ways to create evidence and draws from the idea that is central to the forensic imagination: that all activities leave a trace.[139]

Eyal Weizman has developed the idea of 'forensic architecture' as a methodology that connects aesthetic practices, activism, and science to describe and analyse, in political

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[132] Ibid., p. 65.
[133] Ulrich Beck, *Reflexive Modernization: Politics and Aesthetics in the Modern* (Polity Press, 2004), pp. 1-55.
[134] 'The world of the visible must be investigated, relativized with respect to a second reality, only existent in thought and concealed in the world.' Beck, *Risk Society*, p. 72.
[135] Beck quoted in Lupton, *Risk,* p. 70.
[136] Beck, *Reflexive Modernization,* p. 2.
[137] Dieter Roelstraete, *The Way of the Shovel: On the Archaeological Imaginary in Art* (Museum of Contemporary Art of Chicago and University of Chicago Press, 2013).
[138] Architectural historian and writer Jane Rendell suggests that 'to write sites rather than about sites' is the process that allows new configurations, memories and dreams to enter the space of urban research.
[139] Susan Schuppli, *Material Witness. Media, Forensics, Evidence* (The MIT Press, 2020), p. 9.

terms, the architecture and the built environment that have been shaped by modern warfare and 'environmental violence', as well as their visual representations within the processes of international humanitarian law.[140] Forensics turns architecture into an investigative and multi-layered political practice, a mode for addressing the past through its spatial materialisation[141] to critically analyse the impact of new types of evidence on political and legal processes. Forensic architecture examines weak signals, information gaps, and 'absences' that may help to identify, detect, question, and recognise potential crimes without accessing technologies and information owned by rich states or corporations. Weizman refers to this as the 'threshold of detectability'[142] that disassembles the bias towards visible and clear evidence. His methodology offers a geopolitical reading of space and proposes that, in contrast to science and law, politics are driven by a desire to change the way things are.[143] Through the use of photography and scientific devices, including satellite images, shadows, dust, debris, plume, and other 'metadata' extracted from low-res images, forensic architecture analyses the aftermath of environmental destruction and outlines the relationship between the individual and the environment[144] to find evidence, and articulate and challenge contemporary notions of public truth. This use of aesthetics as an investigative tool to analyse political processes and their effects transforms material objects or landscapes into data and imagery,[145] and raises questions of detectability and responsibility.

Central to the research developed during my first walk in Covas do Barroso during May 2021 was Susan Schuppli's notion of 'material witness' which I investigated through the lens of waste matter deposited on the Barroso landscape near the area where Savannah Resources has been prospecting for lithium. Inspired by Vladmir Shevchenko´s 1968 film on the Chernobyl explosion, Schuppli developed her concept of 'material witness' to refer to the invisible agents that record evidence of passing events to which they can bear witness.[146] Isabelle Stenger, a Belgian philosopher of science who has influenced Susan Schuppli's work on material witness, argues that in the same way that a dead body and bones have capacity to bear the imprint of a lived life, researchers must accept the

[140] Daryl Martin, 'Introduction: Towards a Political Understanding of New Ruins', *International Journal of Urban and Regional Research*, 38, 3 (2014), pp. 1037-1046, doi: 10.1111/1468-2427.12116.
[141] Eyal Weizman, *Forensis. The Architecture of Public Truth* (Sternberg Press, 2014), p. 19.
[142] Eyal Weizman, *Forensic Architecture. Violence at the Threshold of Detectability* (New York: Zone Books, 2017), p. 128.
[143] Ibid., p. 129.
[144] Weizman, *Forensis*, p. 24.
[145] Ibid., p. 10.
[146] Schuppli, *Material Witness.*

possibility that it is not the human but the material that asks the questions. Schuppli goes further, to argue that material not only has the capacity to make and bear witness to history; it also has the power to contradict public truths and to create new narratives as politicising agents.[147] The use of different media and practices that convert testimony and artefacts into matters of legal evidence raises important questions of value and scale in relation to evidential materials.

If evidential materials, such as photographs and videos, are often changed to accommodate their presentation in court, functioning thus as traces of the past alongside the narrative, then it can be said that they go through processes of interpretation and evaluation of evidence.[148] Parts of it are missing, discarded, or simply recorded over to free up space (‘erasure as re-recording’) because at the time of the recording its evidential value was not recognised. Thus, the fragmented nature of evidential materials functions as a kind of palimpsest that allows presentations to be verified, managed, and transformed by judicial instruments. As Schuppli suggests, evidential materials not only carry information related to a potential crime but are also themselves a register of the court´s protocols by carrying trace evidence originating from different events, and therefore are assigned the condition of ‘material witnessing’.[149] In that sense, forensics might not put us closer to the truth of things, but it opens up the expressive potential of things that might help to rearrange the entire narrative, and, as Haraway notes, ‘reorganising the narrative field by telling another version’ is a vital process for creating new meanings.[150] Haraway’s approach to telling stories shows us that by creating new ways of thinking and relating to the world, including waste and waste materiality, we are able to challenge dominant narratives and hierarchies and recognise the complex and interconnected relationships between humans and other beings.

By focusing on the ways we perceive and relate to waste, I am seeking to demonstrate that industrialisation, urbanisation, and capitalism are racialised practices[151] by showing how the substrate of the Earth and resource extraction must be seen as an intrinsic part of the waste production, economic system, and social and spatial (in)justice that takes place

[147] Ibid., pp 19-20.
[148] Johanne Helbo Bondergaard, *Forensic Memory. Literature after Testimony* (Springer International Publishing, 2017), p. 218.
[149] Schuppli, *Material Witness*, p. 17.
[150] Donna Haraway, ‘Making Oddkin: Story Telling for Earthly Survival’, Lecture, Yale University (2017), [Youtube video]. <www.youtube.com/watch?v=z-iEnSztKu8>
[151] Laura Pulido, ‘Racism and the Anthropocene’, in G. Mitman, M. Armiero, & R. Emmett (eds.), *Future Remains: A Cabinet of Curiosities for the Anthropocene* (University of Chicago Press, 2018), pp. 117, 121.

on its surface. The conversion from the Earth's geological materials into the 'now-ness' of contemporary life demonstrates the power dynamics of that exchange: new extractive practices[152] strongly recall the colonial capitalist inheritance and the exploitation of resources (mining) in which value is withdrawn without consent, care or knowledge of the real impact of that extraction to the plants and bodies in that environment.[153] To envision beyond Macarena Gómez-Barris´s idea of the 'colonial Anthropocene'[154] it thus becomes pertinent to imagine 'emergent alternatives'[155] to extractive capitalism that will enable us to develop a new idea of progress that is not destructive to life on the planet and that will allow us to re-situate human, inhuman, and nonhuman relations. These power dynamics between the colonised 'other', as a subordinate and inferior being, and the coloniser that enable control of territory and the social production of (in)justice, expressed in defined and regulated spaces, can also lay the groundwork for resistance and action, as suggested by Edward Said[156] and the historical ecology scholar Carole Crumley, who indicates that understanding the Anthropocene might help to raise awareness of the environmental destruction of our actions, which could mobilise communities into action.[157]

In the 1968 article 'A Sedimentation of the Mind: Earth Projects', Robert Smithson draws our sensory and imaginative attention towards the materiality of the earth's surface[158] and suggests that the process of the earth's geological movements is similar to the way our cognitive and creative processes function.[159] Smithson thus refers to this initial process, with real or fictional agents[160] that allows thought and creativity when an artist makes

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[152] Kathryn Yusoff, 'Mine as Paradigm', *E-Flux,* June 2021, p.1. <https://www.e-flux.com/architecture/survivance/381867/mine-as-paradigm> [accessed: 15 January 2021].
[153] T.J. Demos and others, *The Routledge Companion to Contemporary Art, Visual Culture, and Climate Change* (Taylor & Francis, 2021), p. 121
[154] Macarena Gómez-Barris, *The Extractive Zone: Social Ecologies and Decolonial Perspectives* (Duke University Press, 2017).
[155] Adrienne Maree Brown, *Emergent Strategy. Shaping Change, Changing Worlds* (AK Press, 2017), p. 5.
[156] Edward W. Soja, *Seeking Spatial Justice.* Globalization and Community Series (Minnesota University Press, 2010), pp. 36-37.
[157] Hélène Ducrus, 'Is Humanity Already Aboard a Planetary Titanic? An Interview with Carole Crumley', *EuropeNow,* 'Facing the Anthropocene', 2 May 2017, <www.europenowjournal.org/2017/05/02/an-interview-with-carole-crumley> [accessed: 25 July 2022].
[158] In the section 'The Wreck of Former Boundaries', Smithson writes 'The strata of the Earth is a jumbled museum. Embedded in the sediment is a text that contains limits and boundaries which evade the rational order, and social structures which confine art. In order to read the rocks we must become conscious of geologic time, and of the layers of prehistoric material that is entombed in the Earth's crust.' Robert Smithson, 'A Sedimentation of the Mind: Earth Projects', *Artforum*, September 1968.
[159] In the section 'From Steel to Rust', Smithson writes: 'Oxidation, hydration, carbonatization, and solution (the major processes of rock and mineral disintegration) are four methods that could be turned toward the making of art', Ibid.
[160] Simon O´ Sullivan, and David Burrows, *Fictioning* (Edinburgh: University Press, 2019), pp. 125-133.
On fictionality as a mode of knowledge, see also H. Paul, *Critical Terms in Future Studies* (Springer International, 2019), pp. 119-125.

contact with matter, as 'abstract geology'.[161] In order to explain the time scale of the Earth[162] and to draw attention to how matter interacts with the mind,[163] Smithson wanted his work to be part of the same natural layering processes and topographic displacements.[164] As Turpin points out, this interplay between mind and matter[165] highlights the entropic character of Smithson's work,[166] while mapping a dynamic relationship with the landscape.[167] Thus, Smithson´s critical practice[168] experiments with the geological: his understanding of earth processes makes us aware that 'we inhabit the geologic'[169] and recognises that sensation and presence,[170] rather than the representation of the landscape, is where the theoretical and practical potential of aesthetics resides. Therefore, based on Fuller and Weizman´s work on investigative aesthetics, the ability to sense and respond to sensing could be considered as part of an 'aesthetics of otherness'. This could inspire new forms of public art, in which contemporary art, political ecology, and environmental humanities[171] may meet.

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[161] Simon O'Sullivan, 'From Geophilosophy to Geoaesthetics: The Virtual and The Plane of Immanence vs. Mirror Travel and The Spiral Jetty', in *Art Encounters: Deleuze and Guattari. Renewing Philosophy* (Palgrave Macmillan, 2006), pp. 98-120, doi: 10.1057/9780230512436_5.

[162] Philip Hüpkes, and Gabriele Dürbeck, 'Aesthetics in a Changing World: Reflecting the Anthropocene Condition through the Works of Jason deCaires Taylor and Robert Smithson', *Environmental Humanities* 1, 13.2 (2021), pp. 414–432, doi: 10.1215/22011919-9320222.

[163] In the section 'The Value of Time', Smithson writes: 'The fictions erected in the eroding time stream are apt to be swamped at any moment. The brain itself resembles an eroded rock from which ideas and ideals leak.' to demonstrate how mind and matter are entangled. (Smithson, 'A Sedimentation of the Mind: Earth Projects').

[164] 'Smithson did not seek the Spiral Jetty to be a sculpture of the environment, he wanted it to become an active variable in the environment, re-configuring and re-ordering the landscape, and partaking in the natural processes of sedimentation, crystallisation and erosion.' Fernando Dominguez Rubio, 'The Material Production of the Spiral Jetty: A Study of Culture in the Making', *Cultural Sociology*, 6.2 (2012), pp. 143-161 (p. 149), doi: 10.1177/1749975512440226. [accessed 21 April 2022]

[165] The French philosopher Henri-Louis Bergson argues that memory is the interplay between mind and matter. Henri-Louis Bergson, *Matter and Memory* [1896] (Zone Books,1991), pp. 13, 4.

[166] Etienne Turpin, 'Robert Smithson's Abstract Geology: Revisiting the Premonitory Politics of the Triassic', in Elizabeth Ellsworth and Jamie Kruse, *Making the Geologic Now* (Punctum Books, 2012), pp. 173-178. [accessed 5 April 2022]

On Smithson´s approach to the geological in terms of methods and artistic experience see also the booklet from the exhibition 'Robert Smithson. Abstract Cartography', at Marian Goodman Gallery, New York, 24 June-20 August 2021, <www.mariangoodman.com/usr/library/documents/main/smithson-2021-nyc-newspaper.pdf> [accessed 5 April 2022].

[167] Kathryn Yusoff and Jennifer Gabrys, 'Cultural Geographies in Practice: Time Lapses: Robert Smithson's Mobile Landscapes', *Cultural Geographies*,13.3 (2013), pp. 444-450 (p. 448), doi: 10.1191/1474474006eu360oa.

[168] 'Critical spatial practice' is a term introduced by Jane Rendell in 2002 to describe urban interventions that push the boundaries of art and architecture to interact with social and aesthetic issues.

[169] Elizabeth Ellsworth and Jamie Kruse, *Making the Geological Now: Responses to Material Conditions of Contemporary Life* (Punctum Books, 2013), p. 25.

[170] Matthew Fuller and Eyal Weizman, *Investigative Aesthetics. Conflicts and Commons in the Politics of Truth* (Verso 2012), p. 12.

[171] The interdisciplinary approach of my research journey has led me to different fields of knowledge that contribute to a greater understanding and articulation of the lines of thought and enquiry I have explored since I started this journey. On the environmental humanities, see the journal *Environmental Humanities*, published by Duke University Press. read.dukeupress.edu/environmental-humanities [accessed 6 April 2022]

II. *Towards a Public Art policy for Spatial Justice*

> *Injustice anywhere is a threat to justice everywhere. (...) Whatever affects one directly, affects all indirectly.*
>
> – Martin Luther King, Letter from Birmingham, Alabama jail, April 16th, 1963

By analysing the intersection between race, capitalism, colonialism, and the Anthropocene in the contemporary context of globalisation through the lens of waste and practices of othering in the first part of this chapter, I have demonstrated that the ways we perceive and relate to waste are a factor that contributes to and maintains (in)visible spatial injustices in the city.[172] These uneven geographies in the city are spatially manifested and socio-politically produced.[173] I draw from Soja's notion of social justice being spatial[174] and Hawkins' work on the ethics of waste to shift our perception of waste as an environmental and social problem that creates and maintains unjust geographies towards a view of waste as a resource to explore, speculate, and develop new approaches and methods of art production that recycle, reuse, repurpose, and transform waste into something that is valuable and 'durable'. Furthermore, I examine the work of Dana Cuff on 'immanent speculation' practice[175] within the urban humanities to understand ways to link speculative discourses to imagination and ethics to foster spatial justice, and to change the unjust geographies within which we live our lives. I then conclude by examining how public art can challenge the ways we perceive and relate to waste to strive towards material and spatial reconstitution.

The term 'spatial justice' comes originally from geography and urban studies, and more recently from law,[176] and refers to the material connection between space and justice. In

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and on the urban humanities see Dana Cuff, *Urban Humanities. New Practices for Reimagining the City* (The MIT Press, 2020).

[172] Soja, *Seeking Spatial Justice*, p. 72.

[173] Cuff, *Urban Humanities,* p. 36.

[174] Soja, *Seeking Spatial Justice,*, p. 1.

[175] Cuff, *Urban Humanities,* pp. 36, 175.

[176] Andreas Philippopoulos-Mihalopoulos, *Spatial Justice. Body, Lawscape, Atmosphere.* Space, Materiality and the normative (Routledge, 2015).

For Philippopoulos-Mihalopoulos, both law and justice are articulated through and in space. He suggests that spatial justice is at the core of the most pressing contemporary issues, as it refers to the struggle of different bodies that desire to occupy a certain space at the same time. Central to his work is the idea that spatial justice emerges on the basis of lawscape, atmosphere and bodies (human, non-human, technological,

his book *Seeking Spatial Justice*, Soja, a geographer and urban theorist, argues that justice has a geography[177] by analysing how the theory of justice was given a spatial dimension. He builds his argument by intersecting Said's writing on imperialism and geography, David Harley's concept of 'territorial justice' as the search for a just distribution of social resources, and Henri Lefebvre's ideas about 'the right to the city' with his own thoughts on spatial justice. According to Soja, social processes shape space at the same time as spatiality shapes social processes, meaning that we are always engaged in a socio-spatial dialectic.[178] If space is socially constructed, then human activities play a part in creating and perpetuating geographical inequality, in addition to being moulded by it.[179] Thus, location in space will always have some advantage or disadvantage attached to it,[180] mostly determined by the power imbalances between unequal bodies, whether human or non-human, material or immaterial. My focus is on the human body, but it is crucial to bear in mind that when a human body moves, material and immaterial bodies move alongside it.[181] The pursuit of justice, then, according to Soja, appears to be imbued with a symbolic force that cuts across class, racial, and gender divides to foster a shared political consciousness, build bonds based on shared experience, and draws attention to the most pressing issues facing contemporary society in ways that engage with a wide range of political ideologies.[182] Seeking spatial justice is not a solution, but rather a reorientation[183]: it means creating spatial awareness about the creation and maintenance of unfair geographies that would otherwise remain (in)visible and unchallenged.[184] Spatial justice serves as a lens through which specific injustices in cities can be seen.[185]

Similarly, throughout the thesis I argue that a material reorientation is also necessary. It is at this point that I consider Hawkins' work to be pertinent to the pursuit of spatial justice through the materiality of waste. Hawkins draws our attention to the value of thinking about 'waste as things*'.*[186] Although she acknowledges that the category of value identified by Thompson as 'rubbish' can lead to the creation of new structures of value,[187] she contends

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natural, immaterial, material, elemental, systemic), as well as the idea of spatial justice as a process of reorientation rather than a solution. (p.5)

[177] Soja, *Seeking Spatial Justice,* pp. 1, 7.
[178] Ibid., p. 18
[179] Ibid., p. 72.
[180] Ibid., p. 73.
[181] Philippopoulos-Mihalopoulos, *Spatial Justice,* p. 5.
[182] Soja, *Seeking Spatial Justice,* p. 21.
[183] Philippopoulos-Mihalopoulos, *Spatial Justice*, p. 6.
[184] Soja, *Seeking Spatial Justice.* p. 42.
[185] Cuff, *Urban Humanities,* p. 36.
[186] Gay Hawkins, *The Ethics of Waste. How we Relate to Rubbish* (Rowman & Littlefield, 2006), p. 73.
[187] Ibid., p. 78.

that before other opportunities and potentials can emerge to move the 'thingness' of rubbish from abandonment into another system of value and meaning, it must first be recognised as 'transient matter', open to reconstitution.[188] Repurposing waste as raw material for art production entails reconsidering every practice that prevents us from perceiving the possibilities and realities of what is left. As suggested by Colin Renfrew, what is left plays an active role in the interpretative process and material engagement[189] in which things may gain, rather than lose, meaning.[190] This is what Hawkins calls the 'ethico-political' challenge of waste.[191]

In the book *Urban Humanities: New Practices for Reimagining the City*, Dana Cuff and others suggest that creative engagement and speculation about the future should consider questions of agency, positionality, power, ethics, and spatial justice.[192] The urban humanities provide a means for the inclusion of 'other' marginalised topics and voices in order to expressively undertake new practices that work toward redressing spatial injustices by elevating the actions and cultural artefacts of people in their urban settings.[193] This process takes the form of collaborative scholarship and pedagogy between academics, researchers, and community members in a non-hierarchical, self-reflective, and sited pedagogy to establish methods of community-based learning, laying the groundwork for a number of new exploratory research practices.[194] Exploratory artistic practices pay attention to material things and the spaces of everyday life and help the urban humanities create spaces for alternative futures.[195] The 'immanent speculation' practices that arise from socio-spatial contexts, site uniqueness, and factors inherent to the location in question are essential to this process.[196] For the urban humanities to embrace city change and imagine spatial justice thus means undertaking historical analysis, contemporary cultural and social interpretation, and speculative thinking.[197] Together they create an alternative space where new ideas and approaches are explored

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[188] Ibid., p. 80.
[189] Colin Renfrew, *Figuring it Out: The Parallel Visions of Artists and Archeologists* (Thames & Hudson, 2003), pp. 78-83.
Renfrew proposes that Western contemporary artists offer new ways of understanding and analysing the past, which allow us to rethink what the archaeological project is and what spaces allow this direct experience of an engagement with the material reality of the past.
[190] Caitlin DeSilvey, *Curated Decay. Heritage beyond Saving* (University of Minnesota Press, 2017).
[191] Hawkins, *The Ethics of Waste,* p. 81.
[192] Cuff, *Urban Humanities,* p. 185.
[193] Ibid., p. 36.
[194] Ibid., p. 37.
[195] Ibid., p. 191.
[196] Ibid., p. 36.
[197] Ibid., p. 173.

and tested to challenge the dominant power structures and narratives that have historically shaped urban development.[198]

The development of methods, experimental practices, and research that can contribute to making the uneven geographies of these socially constructed spaces of the city visible and reimagining the experience of otherness is my role as an artist and researcher engaged in urban regeneration practice. This role will help to examine how waste intersects with broader systems of power and inequality and to articulate new and existing knowledge into a new public art policy that strives for spatial justice.

[198] Ibid., p. 271.

CHAPTER 2

Lithium Geographies

Towards a Political understanding of the 'white gold' landscape

> *That zero panorama seemed to contain ruins in reverse, that is — all the new construction that would eventually be built . . . buildings don't fall into ruin after they are built but rather rise as ruins before they are built.*
>
> – Robert Smithson, 1967.[199]

In this chapter I argue that 'ruin waste'[200] – material objects in ruins – creates new knowledge with the capacity to trace urban transformation and search for the 'truth' of events in places shaped by industrial development and ecological decline. The act of walking is combined with archaeological and forensic methods to explore where knowledge is created and what type of evidence is considered valid when addressing issues of ecological crisis, social justice, and inequality caused by the lithium mining industry. The chapter aims to map the traces left by industrial development to contribute to the underlying questions that form the basis of this research on ruin waste and its potential for making visible the material traces of violence[201] and what I am calling a 'new form of imperialism'.[202] To do this, I map uncharted territories and places under extractive capitalism[203] through walking, site-writing, and collected discarded materials. Through these methods and activities I attempt to make visible the trauma and resilience that is kept out of public consciousness. Here I have redeployed silenced narratives and repressed histories that have been erased from the accounts and testimonies that form our national identity.

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[199] Robert Smithson, 'A Tour of the Monuments of Passaic, New Jersey', [Originally published as 'The Monuments of Passaic', *Artforum*, 6.4 (December 1967), pp. 52-57. [accessed 18 May 2021]

[200] Tim Edensor, *Industrial ruins: Space, Aesthetics and Materiality* (Berg, 2005).

[201] I am suggesting that extraction of raw materials is linked to violence because the extractive activities create disputes about land rights, control, and use of nature.

[202] I refer to this by connecting extractive practices and colonialism, and a new wave of resource extraction of lithium in the country justified by the 'green transition'.

[203] The new geological era of the Anthropocene was introduced by Paul J. Crutzen in 2006 to describe the impact humans and industrial development have had on the environment. Jason W. Moore, in 2003, suggested the Anthropocene should be called the Capitalocene, to emphasise the role of extractive capitalism. The term 'extractive capitalism' refers to the political-economic system of extracting wealth from the Earth or workers without care for the risks and fair payment.

Portugal has Europe's largest reserves of lithium, and it is at the time of writing responsible for 11 per cent of its global production.[204] The commercialisation of lithium in Portugal started in 1923, and was mainly developed for the glass, ceramics, and medical industries in small-scale and subterranean mining in the north of the country. However, due to the requirements of the 'green transition', connected to the increased demand for lithium because of its high energy storage capacity, useful for both electronic equipment and electrical cars and the processes of decarbonisation, new open-pit lithium mines will be created in the country in the coming years.[205] This chapter, 'Towards a Political Understanding of the "White Gold" Landscape', is a journey to future sites of lithium mining that are experiencing industrial development and environmental decline to consider how a series of creative interventions can develop new approaches to mapping. The chapter draws from Ulrich Beck's theory of risk to examine the role of subjective perception of risk in the scientific discourse and forensic architecture as an 'agent in negotiations of cultural memory'.[206] It also addresses Robert Smithson´s trip to his home town of Passaic, in which he explores the idea of 'anti-romantic' structures that 'rise into ruin' to establish a dichotomy between an archaeological site and the fiction of its interpretation, which is central to my research. Here I look at the present through an archaeological and forensic lens, accompanied by field practice, to demonstrate, in the form of walks, site-writing, photographs, and material samples observed under the microscope, and explore ideas of archaeology, reality and fiction and the tension between destruction and construction to then examine the capacity of waste to testify to colonial geographies in areas under industrial development.

Considered by Brian Dillon to be one of the artistic and theoretical moments that has informed the shift to the contemporary interest in modern ruins,[207] Robert Smithson´s photo essay 'The Monuments of Passaic' describes his journey from New York City to the

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[204] 'Major Countries in Worldwide Lithium Mine Production in 2023', Statista, January 2024. <www.statista.com/statistics/268789/countries-with-the-largest-production-output-of-lithium/>[accessed 19 April 2021]

[205] Alexander Dunlap and Mariana Riquito, 'Social Warfare for Lithium Extraction? Open-pit Lithium Mining, Counterinsurgency Tactics and Enforcing Green Extractivism in Northern Portugal', *Energy Research & Social Science* 95. 102912, (2023), pp. 1-21 (p. 18).

[206] Johanne Helbo Bondergaard, *Forensic Memory. Literature after Testimony* (Springer International Publishing, 2017), p.1.

[207] Brian Dillon, *Ruins* (Documents of Contemporary Art) (Whitechapel Gallery, The MIT Press, 2011), p. 14. For additional information see also Brian Dillon, 'Decline and Fall. Tracing the History of Ruins in Art, from 18th century Painting to 21st Century Film'. *Frieze,* 1 April 2010 <www.frieze.com/article/decline-and-fall> [accessed: 19 May 2021]. In this article, Brian Dillon considers Smithson's photo essay 'The Monuments of Passaic', (1967) one of the three artistic and theoretical moments that make the shift to the contemporary interest in modern ruins, alongside with Paul Virilio's *Bunker Archeology* (Princeton Architectural Press, 1994) and the collection of essays in Julia Hell and Andreas Schönle, *Ruins of Modernity* (Duke University Press, 2010).

suburban town of Passaic, New Jersey, where he photographs and identifies the material culture of the suburban landscape – pipes, pumps, an outfall, a bridge, a sand-pit – as 'monuments'. Published in *Artforum* magazine in December 1967, the essay made public the artist's 'field practice', that consistently investigated the ways in which context and mediation shape experience, and raises an essential question of what in fact constitutes the artwork in the Passaic project – the magazine essay, the framed photographs as artifacts and/ or the archival materials – all this together emphasises his aim of destabilising the ontology of the artwork and giving shape to an experimental narrative form shaped by science fiction and metafiction.

Robert Smithson´s expanded practice is thus a form of 'mythopoesis' that demands a particular 'fictioning' of the landscape, which allows us to see the landscape through Smithson´s eyes.[208] The landscape is illustrated as he sees it, blurring reality and fiction, as he does not 'invent' anything that isn't already there, but instead re-imagines these 'everyday spaces' (industrial structures) as something more notable. Smithson rejected conventional ideas about perception and knowledge production; instead he focused on the changing relations of place and location. There is a peculiar temporality in his work – past futures and future pasts – as he writes in the essay, the 'holes' of Passaic are the 'memory traces of an abandoned set of futures'.[209] 'Environmental fictioning' thus becomes a method to narrate different pasts and futures within a particular landscape.[210] Consequently, it is the way he reads reality, his perception of place, together with his photographs on the materiality of 'foreign objects' found in a specific location that shows how an art project can produce several new forms with the original material, and this is precisely what makes Smithson´s work 'archaeological'.[211]

But what exactly brings art and archaeology together, and how can this engagement with materiality contribute to redefine waste? Colin Renfrew proposes that Western contemporary artists offer new ways of understanding and analysing the past,[212] which allow us to rethink what the archaeological project is and what spaces allow this direct

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[208] Simon O´ Sullivan and David Burrows, *Fictioning* (Edinburgh: University Press, 2019), pp 125-133.
[209] Robert Smithson, 'A Tour of the Monuments of Passaic, New Jersey', [Originally published as 'The Monuments of Passaic', *Artforum*, 6.4 (December 1967), pp. 52-57 (p. 59).
[210] O´ Sullivan and Burrows, *Fictioning*, p. 133.
[211] Flora Vilches. 'Mirrored Practices: Robert Smithson and Archaeological Fieldwork', in Paul Bonaventura and Andrew Jones, (eds.), *Sculpture and Archaeology* (Routledge, 2011). For additional information on the exploration into the relationship between archeology and contemporary art see Colin Renfrew, *Figuring it Out: The Parallel Visions of Artists and Archeologists* (Thames & Hudson, 2003).
[212] Renfrew, *Figuring it Out.*

experience of an engagement with the material reality of the past. Through this line of thought, we can understand that Smithson was one of those who saw sculpture as an activity (‘art as process’) which brought ‘sculpture off the plinth and into the real world’, just as Renfrew aims to ‘take archaeology out of the trench’.[213] The artwork, as mentioned above – the photographs, maps or the arrangement of stones collected on site and shown in the gallery space – is thus a trace of that activity,.

If we look at this from Weizman´s forensic approach, if archaeology is not directly linked with the materiality under analysis, but only with images of it, then the use of photographs of ‘environmental violence’ in the ‘white gold’ landscape is just a step in the process of constructing the stories we need in order to understand it. Thus, rather than focusing on images of landscapes ruined by the lithium mining industry (‘before-and-after images’) to open up these complex stories beyond processes of mourning,[214] key to this enquiry has been to investigate how the detritus of lithium mining can produce evidence of the threats and hazards of the industry as a way to understand a site and contribute to the description of these places behind their visual representation. To discuss the dialectic of ruins between visible and invisible,[215] I explore how risk theory and forensic architecture can help us to understand how to communicate scientific findings and advance the awareness of the ‘catastrophic impact’, whilst creating a feeling of social and political responsibility for shaping the future and reducing the risks that are created by the current shift from fossil energy resources to ‘green’ energy.

I. Rethinking Risk, Memory, and Knowledge.

Ulrich Beck acknowledges that ‘all societies in human history have been subject to threats to health and life’ (the ‘risk society’) but he differentiates between the scope of hazards in contemporary societies and those in previous eras, as current environmental challenges make it harder to quantify, prevent and avoid risks.[216] He argues that unlike risks in past societies, who saw them as supernatural, or as a concept beyond the control of humans, contemporary hazards are seen as outcomes of modernisation and globalisation linked to

[213] Ibid., pp. 78-83.
[214] Alice Mah, *Industrial Ruination, Community, and Place: Landscapes and Legacies of Urban Decline* (Toronto University Press, 2012), p. 11.
[215] Hell and Schönle, *Ruins of Modernity*, p. 7.
[216] Ulrich Beck, *Risk Society: Toward a New Modernity,* trans. Mark Ritter (London: Sage, 1992), p. 64.

human responsibility and political decisions.[217] Beck recognizes that risks and hazards are a side-effect of the 'industrial society'[218] and acknowledges that these are no longer perceptible through the senses.[219] Following Beck, I believe it is then vital to mitigate this knowledge gap (the lack of a subjective perception of risk) and reflect on the political role of art to map and make visible the 'self-destructive potential' of the "risk society"'.[220] This could lead to political commitment and collective action to identify ways of minimising risks, promoting sustainable development, and compensating the communities affected by ongoing extractive practices. I aim to create counter-narratives that challenge those imposed by governments and industries by making visible the negative effects of lithium mining and the spatial injustices created and justified by the 'green transition'.

On the other hand, by noting that major risks are invisible to human perception and exist only in scientific knowledge, Beck suggests that they are mainly 'objective risks' that lack the 'subjective perception of risk'. It is in this context that I believe Olafur Eliasson´s *Ice Watch* (2014), an art installation composed of thirty ice blocks collected in the Nuup Kangerlua fjord in Greenland and exhibited outside Tate Modern, London, in 2018, succeeds by providing a direct and physical experience of melting ice. Eliasson´s work seeks to raise awareness of the climate crisis as a global phenomenon while calling for change in decision-making and regulatory frameworks. His piece also functions, in my opinion, as a small action of care, as a testimony and source of knowledge that contributes to our understanding of the human impact on the planet. In a similar way to that of using a small portion of melting ice to address the social and environmental impact of global warming as a global crisis, how can detritus testify on behalf of events that precede it? Although Beck acknowledges that some social groups are more affected than others by industrial pollution and climate change, he points out the 'growing inequalities in risk distribution' by observing that the former colonies of the Western world are becoming the world's waste-dumps.[221] Through an experimental and exploratory approach to reading and mapping the Barroso landscape, my visual essay 'Untold Climate Stories'[222] raises some questions that are key to understanding the broader issues of the relationship between waste and spatial justice: what are the effects of this new stratum of the Earth's

[217] Ibid., p. 65.
[218] Ulrich Beck, *Reflexive Modernization: Politics and Aesthetics in the Modern* (Cambridge: Polity Press, 2004) Ibid, pp. 1-55.
[219] Beck, *Risk Society,* p. 72.
[220] Beck, *Reflexive Modernization,* p. 2.
[221] Ulrich Beck, quoted in Deborah Lupton, *Risk* (Routledge, 1999), p. 70.
[222] Visual essay 'Untold Climate Stories. Covas do Barroso: On Matter, Extractivism, Power, and Displacement', in Chapter 2 of this thesis, pp. 57-64.

crust on the geopolitical power of detritus and its capacity to map uncharted territories or places suffering economic dispute and ecological crisis? What link can be established between this human-made landscape, constructed with detritus from the lithium activity, and the violent colonial history in Portugal?

Connecting aesthetic practices, activism and science, Weizman has developed the idea of 'forensic architecture' as a methodology that describes and analyses an architecture and built environment shaped by modern warfare and 'environmental violence' in political terms. Forensics turns architecture into an investigative and multi-layered political practice to address the past through its spatial materialisation[223] and critically examine how new types of evidence can affect political and legal processes. As the etymology of the word suggests, forensics is not isolated from the place and circumstances of investigation where the incidents unfold (the 'field'), nor from the public space where the evidence is presented and contested (the 'forum').[224] Without the access to technologies and information that rich states or corporations enjoy, forensic architecture looks at weak signals, the lack of information and 'absences' that may help to detect, question and recognise potential crimes, identified by Weizman as 'the threshold of detectability'[225] that dismantles the bias towards visible evidence. His approach offers a geopolitical reading of space – and, unlike science and law, politics are driven by a desire to change the way things are.[226]

In their 2012 essay 'Mengele's Skull', Keenan and Weizman argue that the exhumation[227] of the body of the Nazi doctor Josef Mengele in 1985 marked a forensic shift from subject to object and the beginning of a 'forensic aesthetics'.[228] The identification of Mengele's bones, the media reporting of the case, and the attention given to the role that images played in the process as legal witnesses, led to the advance in other international processes involving crimes against humanity. Often related to forensic analysis of the bodies of former political leaders who died in uncertain circumstances, or to identify victims of political oppression and violence, these exhumations marked the 'forensic turn', of

[223] Eyal Weizman, *Forensis. The Architecture of Public Truth* (Sternberg Press, 2014), p. 19.
[224] Ibid., p. 9.
[225] Eyal Weizman, *Forensic Architecture. Violence at the Threshold of Detectability* (Zone Books, 2017), p. 128
[226] Ibid., p. 129.
[227] Exhumation is an act of unearthing a buried individual and it is undertaken to assist the judicial system in finding the cause of death or an individual identity.
Wilson Jilala and others, 'Forensic Exhumation and Human Remains Identification: A Gap between the Inquest Act 1980 and Medico Legal Education in Tanzania', *Forensic Science International. Synergy*, 5.100276 (2022), doi: 10.1016/j.fsisyn.2022.100276.
[228] Weizman, *Forensis,* pp. 21, 39.

human rights towards forensic methods,[229] which are also involved in processes of mourning and memory work.[230] Understood as more objective than human testimony, and usually registered in silence, distortion, confusion or trauma, the scientific approach of a forensic analysis has a persuasive power that is increased by the appropriation of the ethical claim of testimony, as the bones and dead bodies 'speak' to tell their stories (osteobiography). Mengele´s identification also provided an alternative narrative: not the witness story, but 'of the thing" in context of the investigation of war crimes and human rights. The increasing number of forensic exhumations, the use of DNA tests, 3D scans, nanotechnology, and biomedical data motivated by judicial considerations taking place across the world in the search for the truth (cause of death), evidence about past events and the identification of their victims, thus becomes important in order to come to terms with the past (often meaning closure and reparation), to claim justice, and to challenge historical and political narratives. Forensics is, then, a political practice, as it has more to do with memory work and history-writing than with any judicial processes related to the event itself.[231]

The role of forensics in memory work and history-writing becomes an important aspect of memory politics in Portugal, as we can observe a continuous non-recognition of the violent past of colonialism there. Portugal was the longest-running colonial empire in world history: starting with its capture of Ceuta in 1415 and continuing until the transfer of Macau to China in 1999, but memorials to the victims of the Portuguese empire, and those from the twentieth century under Antonio Salazar's dictatorship (1933-1974), are absent. Somehow the violence of six centuries of colonial violence is constantly naturalised by a narrative influenced by Gilberto Freyre´s theory of 'lusotropicalism',[232] in which Portugal's colonial past is camouflaged, or even erased, by the glorification of the discoverers and the 'harmony' between the various countries that constitutes 'lusophony'. If memory should answer the aspirations of the present,[233] then why are the real social and political issues raised by, for example, the recent movement of #BlackLivesMatter not part of the questioning of Portugal's colonial past in the public sphere?[234]

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[229] Weizman, *Forensic Architecture*, p. 78.
[230] Johanne Helbo Bondergaard, (2017) *Forensic Memory. Literature after Testimony* (Springer International Publishing, 2017), p. 217.
[231] Ibid., p 10.
[232] Silva, Filipe Carreira da, and Manuel Villaverde Cabral, 'The Politics of the Essay Lusotropicalism as Ideology and Theory', *The American Sociologist, 51, 381–397* (2020), doi: 10.1007/s12108-020-09459-9.
[233] Maurice Halwachs, quoted in Anne Whitehead, *Memory* (Routledge, 2009), p. 126.
[234] In Chapter 4, I further analyse how waste generated from raw material extraction reveals colonial legacies and (potential) neo-colonial structures of exploitation.

II. 'Everything records'[235]

The shift from subject to object also led to the shift from the object to the field, which in the context of forensics outlines the relationship between the individual and the environment.[236] Forensics analyses the aftermath of war and genocide by using photography and scientific devices, ranging from satellite images to shadows, dust, debris, plume and other metadata extracted from low-res images, to find evidence to articulate and challenge contemporary notions of truth. These methods, as employed by Forensic Architecture, are important to the progress of my research on the capacity of waste to challenge historical truths – they help me to understand forensics as an aesthetic practice, as it depends on how things are sensed, recorded, and presented. Aesthetic means are thus employed as investigative tools or as modes of investigation for analysing political processes and their consequences, to animate and convert material objects or landscapes into data and images[237] and to raise questions of detectability and responsibility.

Thinking this way seems to offer here a reconceptualisation of memory and knowledge. Schuppli argues that material has both the capacity to make and bear witness to history and the power to challenge it by creating new narratives as 'politicizing agents'.[238] The use of different media and practices to convert testimony and artefacts into matters of legal evidence brings up important questions about how these evidential materials (e.g. photos, videos) are valued. As Schuppli points out, these evidential materials convey information about potential crimes, but they also carry traces from the procedures of the court (e.g., processes of interpretation and evaluation)[239] alongside the narrative, and thereby they act as forms of material witnessing.[240] Further, forensic practice may not reveal the truth, but rather it unlocks the expressive possibilities of things to reshape the narrative. This aligns with Donna Haraway's proposal that 'reorganizing the narrative field by telling another version' is vital to the creation of new meanings.[241]

The creation of new meanings can also be made through scale. In Smithson's non-site

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[235] The title refers to Freya Marshall´s interview with Eyal Weizman in *Mono-Kultur*, 48. http://mono-kultur.com/issues/48. [accessed: 20 May 2021]
[236] Weizman, *Forensis,* p. 24.
[237] Ibid., p. 10.
[238] Ibid., pp. 19-20.
[239] Bondergaard, *Forensic Memory,* p. 218.
[240] Susan Schuppli, *Material Witness. Media, Forensics, Evidence* (The MIT Press, 2020), p. 17.
[241] Donna Haraway, 'Making Oddkin: Story Telling for Earthly Survival', Lecture, Yale University (2017), [Youtube video]. <www.youtube.com/watch?v=z-iEnSztKu8>

works, a point on the map expands to the size of a land mass (large scale becomes small), the global scale and impact of industrial pollution or the threshold condition that objects close to the size of a pixel occupy.[242] All three examples in the chapter embody the dialectics of ruins between absence and presence, fragment and whole, and visible and invisible.[243]

Through focusing on the artificial landscapes being created with the debris of lithium prospecting activities which seem to ask us to forget the environmental destruction caused by the 'white gold' mining industry, this 'counter-cartography'[244] reveals a new layer of the Earth's strata in a place suffering economic dispute and ecological crisis, and its approach of subjective and imaginative enquiry can stand as a challenge to the narrative being told to local communities. Thus, the chapter demonstrates the capacity of 'ruin waste' and artistic research to provide testimony, to show the unseen, uncover the unknown, and address the repressed. Mining waste (tailings) sedimented on the landscape not only provides witness to Savannah Resources' operations in the region; it also points to an ongoing social-ecological disaster (ecocide).

[242] Weizman, *Forensic Architecture,* p. 27.
[243] Hell and Schönle, *Ruins of Modernity.*
[244] Edward Said´s 'counter-cartography' is a form of re-drawing the post-colonial map to give voice to those often ignored.

VISUAL ESSAY

Untold Climate Stories.

Covas do Barroso: On Matter, Extractivism, Power, and Displacement.

A journey to Covas do Barroso, northern Portugal, June 2021

The present returns the past to the future.

– Jorge Luis Borges

The following visual essay translates my embodied experience into writing, a process that blurred the real, the imaginative, and the fictional to examine waste capacity to bear witness of extractive practices in the Barroso Mines. Here I critically engage with Barroso's complex dimensions to explore how creative practice and art based methods produce knowledge of a site.

Figure 2.1. Dirt path.

Figure 2.2. Traces of a tree.

Figure 2.3. Mine tailings.

1.

Departing from the forensic imagination that 'every contact is perceived as leaving a trace'[1] and much informed by Schuppli´s notion of matter and its capacity to register change,[2] I travelled to Covas do Barroso in Boticas,[3] northern Portugal, where the future lithium mines of Barroso will be located. I came to investigate the landscape and potential traces left by the activities undertaken by the British international mineral resource company Savannah Resources. I was surprised to see this world agricultural heritage site, with its untouched and beautiful rural landscape, where large domestic animals (cows) were crossing

streets and people (mostly older than 70) were living in tiny stone houses, often side by side with the animals. After spending some time in the village, I met two women in front of the Minas do Barroso Information Centre, where I read a two-sided letter from Savannah Resources to the local community. They found it a bit odd that I was taking photographs of the letter and decided to start a dialogue: 'They tell us nothing, if you want to see it you need to go to the mountains [...] we haven't been there'. Our short conversation made me realise that their resistance to future development in the region is marked by a subjective perception of (potential) risk, but their opinion lacked a certain confidence due their lack of access to scientific knowledge which should, in their opinion, be given by the local council and the international company operating in Barroso.

I then left Covas do Barroso and its narrow streets and drove towards the mountains, where the company have been undertaking research into the lithium reserves. Here I met new forms of land ownership that determine how they can be navigated (they are inaccessible by a normal car), with pathways that sliced through large parts of the landscape and dead trees lying on their sides, and after some kilometres, and restored mobile connection, I found the Savannah Resources plaque indicating I had arrived. The different

Figures 2.4 and 2.5. Google map images from Covas do Barroso that depict the walking path to (blue) and from (yellow) one of Savannah Resources' operational fields.

Figure 2.6. Satellite view.

trails, clear on Google images, had a steep topography and were now full of holes marked by heavy machines, rainwater and vegetation. I parked the car and decided to walk. The views are stunning, and the silence of the place is only broken by the sound of water from a small stream nearby. I walked left towards the water, and after a few steps at a slow pace, I started to observe different colonies of ants and vertical pipes which I understood were the boreholes used to prospect for lithium. They were mainly blue plastic, measuring up to one metre high and about 10-12cm in diameter: some were closed on top, others had a concrete base with a written code. Some felt untouched, others slightly destroyed. I observed wells at different elevations placed far away from the others, except in a few areas where three or four boreholes were placed quite close to each other. Different types of scale and value are at stake here: the global green transition, the local ceramics industry, and the sedimented (artificial) deep time layers.

Close to the boreholes I encountered new layers of landscape with a different texture and colour from the rest of the landscape. I found it fascinating to observe these new layers of what seemed to be deposits that form a kind of new sedimentary rock (rock formed by the accumulation or deposition of mineral or organic particles on the Earth's surface that

Figure 2.7. Boreholes with a concrete base with codes indicating the locations of Savannah Resources' lithium prospecting operations.

Figure 2.8. Mine tailings deposited as sediment on the terrain.

Figure 2.9. Displacement and disposal of rocks.

appear to have settled in place), because they made me see them as if these different layers of rocks were now witnesses of a new chapter of history in Barroso's earth, in the same way that bones would give information about a human life. I decided to collect different samples to archive and make them visible during this phase of my intervention, as I noticed that waste and its disposal is normally made as invisible as possible. Focusing on Schuppli's operative concept of 'material witness', these samples of discarded detritus are, then, the hidden and repressed ecological dimensions of the mining industry: they are the traces of the industrial era inscribed into landscape. This infertile and polluted land testifies to the destruction of the landscape, becoming at the same time a kind of wasteland that points to both loss and future potential, thus giving an expression of the subversive potential of ruin waste[4] to emerge between the dialectics of destruction and construction.

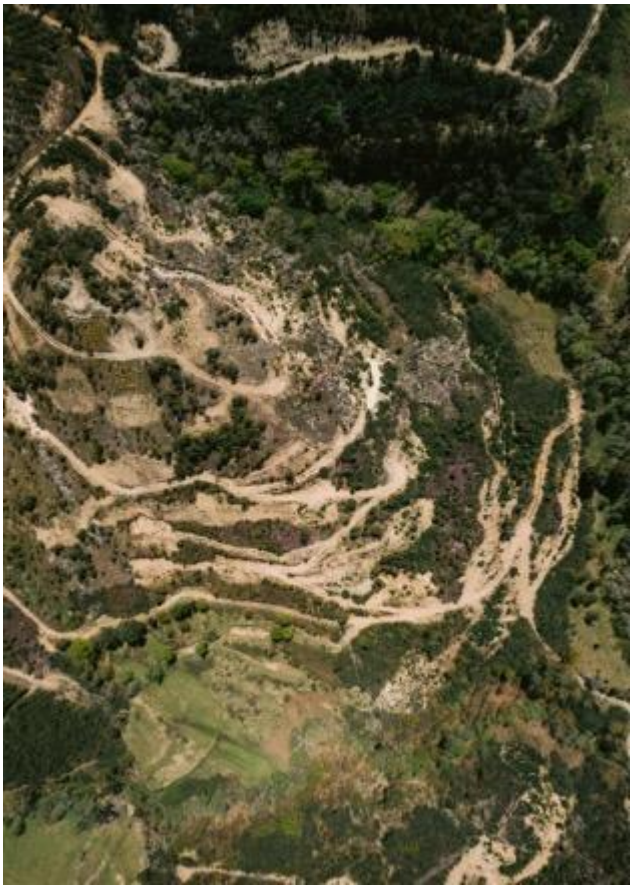
2.

Picking up any traces that could testify to the mining activities taking place in Barroso, I decided to analyse the leaves I had collected and the 'ruin waste' under the microscope. Soon, the 'black' holes in the leaves took me to the aftermath of the Anthropocene, in which a strange landscape is created by humans and nature, the 'edges' transformed into landscapes by the sea, these fragmented rocks tracing mutations that become a kind of multi-layered skin of hybrid beings. Not thinking about the colonial past now becomes almost impossible: it is as if these plants and ruin waste are calling my attention to the bodies of Black enslaved people found in a golf resort in Algarve during the construction of a car park.[5] *How can we still be silent about our colonial past? How can this detritus tell stories of colonial geographies and (potential) neo-colonial structures of exploitation?*

Figures 2.10.-2.12. Collected leaves analysed under the microscope.

3.

May 2022.



Figures 2.13 - 2.18. Drone photographs of the mountains in Covas do Barroso documenting the changing landscape.

4.

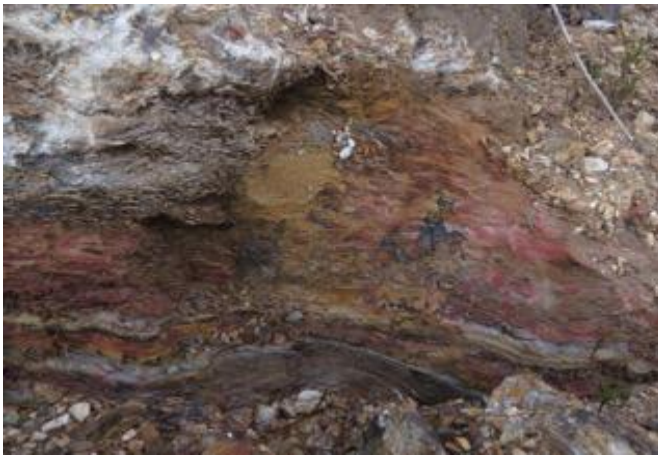
Untold Climate Stories, Lived experiences, 2024.

Figure 2.19. Banner 'No to mines, Yes to life' in front of the football pitch in Covas do Barroso.

Figure 2.20. Savannah sign with the message 'Facilitating the energy transition in Europe'. Savannah Resources Information Center, Covas do Barroso.

Figures 2.21 - 2.23. Interdisciplinary group walking with community member.

Figures 2.24 - 2.25. Prospecting for lithium is changing the *baldios* (communal land) and the lives of the local community. Machines are blocked by international activists for several months, and some areas of the *baldios* have blocked access to non-Savannah team members.



Figures 2.26-2.27. Geological strata and the *baldios* contaminated water supply.

Figure 2.28. Soil samples stored in plastic bags.

Images 2.29-2.31. Different types of boreholes identified. While most of them are about 10-12 cm diameter, this type was found near an area of pine trees. They are about 20-25cm in diameter and short. It is believed by the community that these were the first boreholes used in the region.

ENDNOTES

1 Susan Schuppli, *Material Witness. Media, Forensics, Evidence* (The MIT Press, 2020), p. 9.

2 Ibid., p. 7.

3 Covas do Barroso, Boticas, in Vila Real, northern Portugal, is thought to have the largest reserve of lithium in Europe.

4 Tim Edensor, *Industrial Ruins: Space, Aesthetics and Materiality* (Berg Publishers, 2005). Edensor refers to material objects in ruins as 'ruin waste'.

5 Vale da Gafaria, *Contested Legacies Portugal,* contestedlegaciesportugal.org/3-Vale-da-Gafaria

CHAPTER 3

Extractive Practices. The (invisible) 'debris of violence'[245]

On Extractivism, Colonial Geology, and the Anthropocene

> *Geology is a mode of accumulation, on one hand, and of dispossession, on the other, depending on which side of the geologic colour line you end up on.*
>
> – Kathryn Yusoff, 2018:3[246]

This chapter examines the ways in which mining waste (might) testify to the colonial exploitation and transformation of natural resources into capital.[247] It aims to investigate how waste can be perceived as a source of knowledge of past events and as an 'emergent alternative'[248] to extractive capitalism. The chapter considers key concepts of green extractivism discussed in the two following sections. First, 'The Anthropocene, "Colonial Geology" and Extractive Capitalism' examines a set of considerations that bring these three terms together to explore the ways in which recent decolonial scholarship places the capitalist politics of ecology within colonial history and its racialised violence. Second, 'Geological Time and Sedimentation in the work of Robert Smithson' moves us towards the notion of 'abstract geology' and sedimentation to explore what might constitute a critical aesthetic of extractivism and of otherness. By referencing the Barroso mines in northern Portugal, I return to and conclude with a reflection on the interdisciplinary methodology that enabled me to assemble evidential traces of material changes taking place in the region in order to render my perceptual method and engagement with an extractive zone as a decolonial imaginary.

The chapter draws on Hutton's theory of geological time and geological cyclical features of destruction and renewal, Kathryn Yusoff´s notion of 'white geology' and Gómez-Barris's writing on 'the colonial Anthropocene' to examine the intersection between geology,

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[245] Gastón R. Gordillo, *Rubble: The Afterlife of Destruction* (Duke University Press, 2014), p 185. Gordillo suggests that 'debris of violence' refers to the spatial and cultural sedimentation of a historical legacy of violence.
[246] Kathryn Yusoff, *A Billion Black Anthropocenes or None* (University of Minnesota Press, 2018), p. 3.
[247] Ibid.
[248] Adrienne Maree Brown, *Emergent Strategy. Shaping Change, Changing Worlds* (AK Press, 2017), p. 5.

colonialism, race, Western capitalism, the Anthropocene, and the climate and environmental crisis. By approaching the Anthropocene as having its 'golden spike' in the long and ongoing history of colonialism, the chapter aims to unfold the multiple layers of extractivism to explore the ways in which the extraction of ore and dispossession of matter and bodies is entangled with what happens above the Earth's surface. Combined with forensic analysis, Michael Shanks' approach of the 'archaeological imagination',[249] and artistic sensibilities in an extractive site (the Barroso mines, Portugal), the chapter also draws from Matthew Fuller and Eyal Weizman´s work on investigative aesthetics, and more precisely the notion of 'hyper-aesthetics'[250] and sense-making, Belgian philosopher Isabelle Stengers´ notion of 'mapping into knowledge', and Susan Schuppli´s notion of 'material witness', which was relevant to acknowledge the site walking and 'fictional imaginary' approach of 'letting the material speak' as research data. Thus, the theoretical and practice-led work will address ways in which sedimented waste from the mining industry, in particular those practices taking place in the Barroso mines, can be perceived as sources of knowledge about the colonial geographies of the 'white gold' landscape. To do this, I continue mapping this uncharted territory in northern Portugal – Boticas – through documentary methods of investigative aesthetics and archaeology (practices of visualisation and of documentation) to analyse, record, and make visible the environmental transformation created by the planned lithium mining activities. Here I am also aiming to address the relationship between matter, landscape, and technology to draw attention to the earth's geological structure while developing a critical aesthetic of the 'white gold' landscape in order to make visible its unequal material and wealth distribution.

In contrast to earlier trends of natural protection in rural development, 'green extractivism'[251] involves surveying for critical minerals and seeking to seize landscapes previously preserved as protected areas. As in other European rural landscapes, the exploitation of lithium in Covas do Barroso[252] is taking the form of an increased number of requests for permits to carry out ground testing and create open pits.[253] This poses environmental, ecological, and social threats, as well as creating sociocultural dynamics

[249] Michael Shanks, *The Archaeological Imagination* (Left Coast Press/Routledge, 2002).
[250] Matthew Fuller and Eyal Weizman, *Investigative Aesthetics. Conflicts and Commons in the Politics of Truth* (Verso, 2021), p. 29.
[251] Natasha Bruna, *The Rise of Green Extractivism. Extractivism, Rural Livelihoods and Accumulation in a Climate-Smart World* (London: Routledge, 2023).
[252] Covas do Barroso, situated in Boticas in the district of Chaves, Portugal, is an UNESCO World Heritage site for Agriculture and best known for having Europe's largest lithium reserve.
[253] Camila del Mármol and Ismael Vaccaro, 'New Extractivism in European Rural Areas: How Twenty-First Century Mining Returned to Disturb the Rural Transition', *Geoforum,* 116 (2020), pp. 42-49, doi: 10.1016/j.geoforum.2020.07.012.

that might have a crucial impact on the future development of rural areas in the name of critical mineral extraction.[254] 'The (invisible) 'debris of violence'. On Extractive exploitation, Colonial Geology and the Anthropocene' is part of my continuing journey to sites of lithium mining in rural areas of Portugal that are experiencing industrial development to research a potential shift towards raw materials sovereignty within Europe.[255] I seek to consider how art interventions can document and repurpose the future ruins of our surroundings. I am interested in a critical awareness of the complexity of a material (lithium) that is present in our daily life and how that material, extracted from nature, is entangled with the development of technologies that makes the extraction of the ore possible, industrialised, and traded into products in our daily life, with the dispossession of matter and bodies that is a result of a colonial capitalist inheritance.

I. *The Anthropocene, 'Colonial Geology' and Extractive Capitalism*

Considered to be the 'father' of geology, James Hutton described the concept of 'deep time'[256] by observing that the Earth is in a constant cycle of destruction and renewal[257] and rejecting the notion that the world was created by humans or a divine force. By surveying and collecting rocks at Siccar Point, Scotland, in June 1788, he observed that rocks and soil are eroded while forming new sediments that are then buried and turned into new rocks by heat and pressure, in a continuing process. His theory was later made popular by Charles Lyell (as 'uniformitarianism') in *The Principles of Geology*, published in 1830, in which Lyell verified geological features that were constantly shaped by cycles of

[254] Anthony Bebbington and others, *Governing Extractive Industries: Politics, Histories, Ideas* (Oxford University Press, 2018), doi: 10.1093/oso/9780198820932.001.0001.
[255] The EU's new strategy on self-provision.
[256] 'Deep time' is a term introduced by John McPhee in 1981 to the concept of geological time developed by James Hutton after his observations at Siccar Point in June 1788. Hutton's theory had a similar impact on society as Charles Darwin's theory of evolution, 'On the Origins of Species' (1859), which actually owes a little to Hutton´s concept of deep time and his rejection of the notion that the world had been created by God. Further reading on Hutton´s work and understanding of the principles of modern geology can be accessed in Marcia Bjornerud´s book *Reading the Rocks. The Autobiography of the Earth* (Basic Books, 2006).
[257] Jim Morrison, 'The Blasphemous Geologist who rocked our Understanding of Earth´s Age', *Smithson Magazin*e, 29 September 2016.
<www.smithsonianmag.com/history/father-modern-geology-youve-never-heard-180960203.> [accessed: 15 January 2022]. James Hutton (1726-1797) was a Scottish geologist best known for his theory about geological history of the Earth published in 1788 titled 'Theory of the Earth'. Through chemistry he understood this effect of heat on rock, proving thus that it is heat and pressure that form rocks over a long period of time through gradual processes, not precipitation, as had been thought before. Joseph Black, a chemist who discovered carbon dioxide, helped Hutton in his discovery of the effect of heat on rock. Both were leading figures of the Royal Society of Edinburgh, among others, including the philosopher David Hume, the economist Adam Smith and James Watt, the inventor of the steam engine (1773-1775) who paved the way for the industrial revolution.

sedimentation and erosion through a very slow process of lifting up, as Hutton had observed . Yet the Anthropocene (‘the era of humans’) evidences how the agency of industrialised civilisation has profoundly shaped the Earth in ways that can be compared with processes of deep time. Eugene Stoermer and Paul Crutzen introduced the term ‘Anthropocene’ in the 1980s to refer to a new geological epoch marked by the human planetary force[258] on the environment and its impact on biodiversity, species extinction, climate change, and ecological crises.[259]

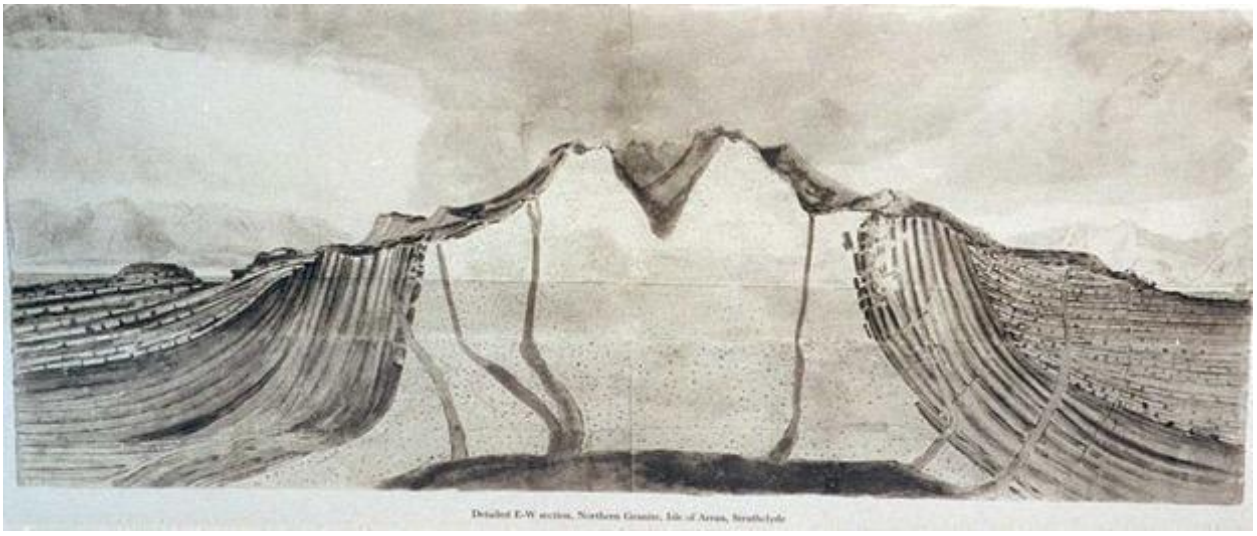

Figure 3.1. Copy of a watercolour by the geologist James Hutton, titled ‘Detailed East-West Section, Northern Granite, Isle of Arran, Strathclyde’ or *Theory of the Earth*. From <commons.wikimedia.org/wiki/File:575016-Theory_of_the_Earth_JamesHutton.jpg > [accessed: 20 February 2022].

During his Nobel Prize acceptance speech in 2002, Paul Crutzen referred to ‘the Anthropocene’ to address the high global consumption of fossil fuels and how the resulting emissions marked a threshold in human geological force on the planet[260] since the Industrial Revolution. His notes led to debates about the Anthropocene’s ‘golden spike’ (origin) and on the ontological, theoretical, and practical relevance and challenges of ‘living in the Anthropocene’[261] among various scholars over subsequent years. The development of agriculture ten thousand years ago, the Industrial Revolution and the great

[258] Richard Grusin, *Anthropocene Feminism* (University of Minnesota Press, 2017), p. ix.
[259] Davis, Janae and others, ‘Anthropocene, Capitalocene, Plantationocene?: A Manifesto for Ecological Justice in an Age of Global Crises’, *Geography Compass*, 13.5 (2019), p.1, doi: 10.1111/gec3.12438. [accessed: 28 December 2021], p. 1.
[260] Joy McCorriston and Julie Field, *Anthropocene: A New Introduction to World Prehistory* (Thames & Hudson, 2010).
[261] John Kress and Jeffrey Stine, *Living in the Anthropocene: Earth in the Age of Humans* (Smithsonian Books, 2017). The book contextualises the Anthropocene by presenting historical and contemporary views of various human effects on Earth.

acceleration (capitalist production, consumption and rise in global population after WWII) have all been proposed as starting dates for the Anthropocene.

More recently, several scholars have argued that the ecological crisis has been caused by the violence, exploitation, and consumption practices of a small part of humanity, recognising colonialism and capitalism as the forces that brought the epoch shift. Vergès introduced the idea of 'the racial Capitalocene' to highlight how colonialism, slavery, and the use of the colour line contributed to a contemporary devaluation of both human and non-human lives. Yusoff expands on this idea by calling attention to the role of geology in shaping the current crisis.

In *A Billion Black Anthropocenes or None*, Yusoff rethinks humans' relationship to geology by asking what role geology has played in the construction of human and non-human matter. By looking at the category of 'human' in the past, Yusoff draws our attention to the inscription of race in Anthropocene sites – mining, extraction, waste, extinction – and its stratifications as a result of colonial divisions of power, territory and life.[262] She suggests that geology defines a shared origin in the racial categorisation of Blackness and displacement (or relocation) with mining practices of the New World: thus racialisation is linked to a material categorisation of the corporeal and mineralogical division of matter.[263] It is Yusoff's idea of a racial dimension of geology, of the Anthropocene as a 'retooling of geology from a discipline of extractive and originary science to a philosophical material formation'[264] that draws my attention, as it provides a theoretical framework for suggesting the materiality of waste as racial to acknowledge the capacity of waste to testify to colonial geographies and challenge historical truths.

Yusoff´s notion of 'white geology' takes us to Lyell´s seminal book *The Principles of Geology*[265] – Yusoff demonstrates the ways geology and racial proposition are interconnected, by writing about race through the language of geology to define the position of race in relation to time in the same way as Lyell's geological theory defines 'the stratification of rock formations and species in time'.[266] Lyell and Yusoff appear to share similar views on race, both understanding that historically 'Blackness' is described as

[262] Yusoff, *A Billion Black Anthropocenes*, p. 62.
[263] Ibid., 2.
[264] Ibid.,14.
[265] Ibid., pp. 74-85.
[266] Ibid., 74.

being ‘delayed in time’,[267] a kind of inferior mode of existence,[268] and therefore suggested as inhuman.[269] It is in this moment when race, time, and geology intersect that the new epoch emerges, as it also seems to be the point at which geology appears to be entangled with extractive processes that transform the ‘inert’ material world into global commodities.

Extraction often refers to arrangements of matter and to the exploitation, dispossession and displacement of bodies and natural resources that are transformed into capital.[270] By focusing on new extractive practices to demonstrate that industrialisation, urbanisation, and capitalism are racialised practices,[271] the chapter seeks to explore how the substrate of the Earth must be seen as an intrinsic part of the economic system and the technological development that takes place on its surface. The transformation of geological materials into contemporary commodities reveals the uneven power dynamics embedded in new extractive practices.[272] These methods and practices evoke colonial legacies in which value is taken without consent, care, or awareness of the real impact of extraction on plants and bodies in that environment.[273]

The negative repercussions of Western utopian dreams are becoming more visible.[274] Indigenous and European rural landscapes are left devastated in the wake of damming, mining and the removal of other forms of resources that can be dug, extracted, exploited or displaced. Consequently, to imagine beyond Gómez-Barris´s idea of the colonial Anthropocene,[275] we must address the ‘slow violence’,[276] the anthropogenic transformations and unequal social ecologies created at a planetary scale through new language and methods that can track racial and extractive capitalism. By using the term ‘colonial Anthropocene’, Gómez-Barris[277] digs into the Earth´s archive of destruction

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[267] Ibid., p. 76.
[268] Achille Membe, *Critique of Black Reason* (Duke University Press, 2017), p. 17.
[269] Yusoff, *A Billion Black Anthropocenes,* p. 76.
[270] Ibid., p. 3.
[271] Laura Pulido, ‘Racism and the Anthropocene’, in G. Mitman, M. Armiero, & R. Emmett (eds.), *Future Remains: A Cabinet of Curiosities for the Anthropocene* (University of Chicago Press, 2018), pp. 117, 121.
[272] Kathryn Yusoff, ‘Mine as Paradigm’, *E-Flux,* June 2021, p.1.
[273] T.J. Demos and others. (2021) *The Routledge Companion to Contemporary Art, Visual Culture, and Climate Change* (Taylor & Francis, 2021), p. 12.
[274] In his book *Utopian Legacies,* John Mohawk suggests “resource extraction, depletion and waste as the by-products of the Western utopian dream. John Mohawk, *Utopian Legacies:a History of Conquest and Oppression in the Western World* (Clear Light Publishers, 2000).
Yusoff, *A Billion Black Anthropocenes,* p. 59. Kathryn Yusoff recognizes colonial afterlives as forms of ‘geotrauma’.
[275] Macarena Gómez-Barris, *The Extractive Zone: Social Ecologies and Decolonial Perspectives* (Duke University Press, 2017).
[276] Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Harvard University Press, 2011).
[277] Gómez-Barris, *The Extractive Zone*.

representing more than five centuries of colonial exploitation to disclose how human and non-human bodies have been reshaped by extractive projects in colonial landscapes. For him, it becomes pertinent to imagine the rhizomatic map of climate change as the result of industrial and colonial exploitation to understand the impending planetary crisis and the material consequences that affects bodies and land to know how to narrate the new extractive practices and their impact on a local scale. Yusoff suggests the abandonment of the colonial human individual towards a global idea of race as an alternative process of undoing geopolitics through 'geopoetics'.[278] The process of 'de-sedimenting' the social life of geology is thus a tool to re-situate the inhuman relations that stand against the division of matter into active (White) and passive (Black) forms, which may or not become subjects depending on their status on the colour line.

II. *Geological Time and Sedimentation in the work of Robert Smithson*

> *The manifestations of technology are at times less "extensions" of man, than they are aggregates of elements. Even the most advanced tools and machines are made of the raw matter of the earth.*
>
> – Robert Smithson, 1968[279]

The aesthetics of geology and its double invisibility[280] has been a fascinating field of study and interest for several artists engaged with the landscape and the natural world, especially since the nineteenth century when the British painter J.M.W. Turner became interested in the 'geological sublime'. The recent revival of geological topics and themes are mainly related to the discussion of the Anthropocene and to the ways in which humans are sensing the (in)finite natural sources of the earth, making us aware that geology functions not only as a subject of scientific enquiry but also as a metaphor and model for the material conditions of our contemporary life.[281] Although Robert Smithson had no

[278] Angela Last´s work on geopoetics, quoted in Yusoff, *A Billion Black Anthropocenes*, p. 54-56. *'*Geopoetics*'* explores the dynamic intersections of poetics and geography, in which the artist / poet / geographer engages with the geographical phenomena (space, place and environment) aiming for participation in planetary life and politics.
[279] Robert Smithson, 'A Sedimentation of the Mind: Earth Projects*'" Artforum*, September 1968.
[280] By looking at the 'geological imagination' of Robert Smithson and Per Kirkeby, who had himself trained as a geologist, I am mentioning 'double invisibility' to refer to 'deep time' and the visible/ invisible structures that configure the physical world, in the context of the Anthropocene and the digital world.
[281] Elizabeth Ellsworth and Jamie Kruse,) *Making the Geological Now: Responses to Material Conditions of Contemporary Life* (Punctum Books, 2013), pp. 6, 10.

relation to, or knowledge of, the debate about the Anthropocene, his artwork and writings are often situated in the context of the Anthropocene.[282] This section thus focuses on Robert Smithson´s notion of 'abstract geology' to describe the relationship between mind, matter, time, and change in relation to landscape and to address the challenges created by the 'geological turn' in the time of the Anthropocene.

In Smithson's article 'A Sedimentation of the Mind: Earth Projects',[283] published in *Artforum* in 1968, he demonstrates his interest in geological time and engages us in new ways of seeing and understanding the entangled relationship between mind and matter by drawing our sensory and imaginative attention towards the materiality of the earth's surface (mud, sand, gravel, soil, dust),[284] and by suggesting that our cognitive and creative processes follow the same rules as the earth's geological movements.[285] This initial process with real or fictional agents, that enables thought and creativity when an artist makes contact with matter, is what Smithson calls 'abstract geology'.[286] Smithson wanted his work to be part of the same natural layering processes and topographic displacements (sedimentation, crystallisation and erosion)[287] to account for the Earth's time scale[288] and to draw attention to how matter interacts with the mind.[289] As Yusoff and Jennifer Gabrys note, this

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[282] Etienne Turpin, 'Robert Smithson's Abstract Geology: Revisiting the Premonitory Politics of the Triassic', in Elizabeth Ellsworth and Jamie Kruse, *Making the Geological Now: Responses to Material Conditions of Contemporary Life* (Punctum Books, 2012), pp. 173-178, doi: 10.21983/P3.0014.1.29.
Philosopher Etienne Turpin suggests ways in which Smithson´s aesthetic practice anticipates the Anthropocene. Additional resources: Turpin, Etienne and Davis, Heather (eds.), *Art in the Anthropocene: Encounters Among Aesthetics, Politics, Environments and Epistemologies*, (Open Humanities Press, 2015). More about his work can also be accessed here: 'Etienne Turpin', MIT <https://act.mit.edu/about/people/etienne-turpin> [accessed 5 April 2022].
[283] Smithson, 'A Sedimentation of the Mind: Earth Projects'.
[284] Ibid.
[285] Ibid.
[286] Simon O'Sullivan, 'From Geophilosophy to Geoaesthetics: The Virtual and The Plane of Immanence vs. Mirror Travel and The Spiral Jetty', in *Art Encounters: Deleuze and Guattari. Renewing Philosophy* (Palgrave Macmillan, 2006), pp. 98-120, doi: 10.1057/9780230512436_5.
[287] 'Smithson did not seek the Spiral Jetty to be a sculpture of the environment, he wanted it to become an active variable in the environment, re-configuring and re-ordering the landscape, and partaking in the natural processes of sedimentation, crystallisation and erosion'. Fernando Dominguez Rubio, 'The Material Production of the Spiral Jetty: A Study of Culture in the Making', *Cultural Sociology* 6.2 (2012), pp. 143-161, doi: 10.1177/1749975512440226.
[288] Philip Hüpkes and Gabriele Dürbeck, 'Aesthetics in a Changing World—Reflecting the Anthropocene Condition through the Works of Jason deCaires Taylor and Robert Smithson' *Environmental Humanities* 13.2, (2021), pp. 414–432, doi: 10.1215/22011919-9320222.
'Deep time' in some of Smithson's land art works, as seen in *Spiral Jetty,* for example, functions as an imprint of the human geological agency on the site, while allowing its own destruction/ disappearance/ unmaking through the same processes of erosion and sedimentation.
[289] Smithson, 'A Sedimentation of the Mind'.

interaction between mind and matter thus maps out a dynamic relationship with the landscape,[290] while emphasising the 'entropic' character of Smithson's work.[291]

By examining the physical and conceptual limits of the landscape, Smithson´s engagement with the geological, his experiments, methods, and aesthetic experiences to chart the landscape[292] not only consolidate his interest in exploratory research, they also question the relationship between the human and the non-human and its relevance to the current climate crisis. Thus, Smithson´s critical practice experiments with the geological and his understanding of earth processes takes us towards a balance between the human and non-human in landscape constructions, while making us aware that 'we inhabit the geologic'.[293] It also acknowledges that the theoretical and practical potential of aesthetics does not reside in the representation of the landscape, but rather creates sensation and presence.[294] In that sense, and drawing from Fuller and Weizman´s work on 'investigative aesthetics', an 'aesthetic of extractivism' or 'otherness' might also include the capacity to sense and respond to sensing. In doing so it can inspire ways forward into new forms of public art, where contemporary art, political ecology, and the environmental humanities might converge.

The forensic shift from subject to object, and the consequent shift from object to the field, outlines the relationship between the individual and the environment.[295] Aesthetic means are used as investigative tools to analyse political processes and their impact, to transform material objects or landscapes into data and imagery,[296] and to raise issues of detectability and responsibility. It is the investigation of the intersection between politics and technology that describes what Fuller and Weizman define as 'investigative aesthetics'.[297] Aesthetic investigation, as Weizman suggests, challenges scientific impartiality and objectivity[298] because aesthetics and imagination are essential to knowledge production in an

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[290] Kathryn Yusoff and Jennifer Gabrys, 'Cultural Geographies in Practice: Time Lapses: Robert Smithson's Mobile Landscapes', *Cultural Geographies*, *13*(3) (2013), pp. 444-450 (p.448), doi: 10.1191/1474474006eu360oa.
[291] Turpin, 'Robert Smithson's Abstract Geology'.
[292] Smithson was influenced by Jorge Luis Borges and Lewis Carroll in looking at maps as fictions.
[293] Elizabeth Ellsworth and Jamie Kruse, *Making the Geological Now: Responses to Material Conditions of Contemporary Life* (Punctum Books, 2013), p. 25 <geologicnow.punctumbooks.com/>, [accessed 8 June 2025]
[294] Fuller and Weizman, *Investigative Aesthetics,* p, 12.
[295] Weizman, *Forensis,* p. 24.
[296] Ibid., p. 10.
[297] Fuller and Weizman, *Investigative Aesthetics,* p, 5.
[298] Eyal Weizman and Rhoda Feng, 'Investigative Aesthetics: Eyal Weizman. Interviewed by Rhoda Feng', *Bomb*, 9 November 2021<https://bombmagazine.org/articles/eyal-weizman-interviewed> [accessed 5 March 2022]

investigative work, as both deal with the production of evidence while questioning it.[299] Such work requires an interdisciplinary methodology and collaborations with different forms of expertise (technical, technological, political, social, economic, ecological etc) in order to bring together different forms of experience and knowledge that might lead to finding and critically interrogating the truth, while challenging structures of power and denying the erasure of knowledge.[300] This is particularly important in the context of green extractivism, as it raises questions about the different forms of knowledge that have been erased in order to destroy and deny evidence of environmental destruction and on the (potential) silenced voices that challenge the status quo of power and knowledge.[301] Investigative aesthetics can thus play an important role in finding new ways of producing and disseminating knowledge (facts) through politics and an assemblage of multiple perspectives that are produced, presented, and verified in the public domain.[302] Aesthetic and artistic practices can in this way build new critical investigations created collectively.

As Fuller and Weizman suggest, in the case of environmental destruction relational and allocated sensing over a long period of time is crucial,[303] as it might not be easy to sense changes in a rock or in water, but based on the forensic imagination that 'every contact leaves a trace',[304] these traces can become an archive of elements that, when analysed carefully, indicate material processes intersecting with, or contaminated by, other processes or patterns in their new relation to the environment, capable of revealing and expressing information about the events that took place.

We can construct diverse relationships between things and form alternative narratives by gathering, observing, and (re)arranging the collected data to form a small piece of evidence. Over the course of this PhD research, I have documented, recorded, and analysed the landscape transformations that the mining industry has been carrying out in Covas do Barroso to analyse forms of power that have normalised an extractive system of imperial control and surveying to enable the capitalist expansion of multinational corporations in the northern region of Portugal in order to understand the politics of extractive practices and their effects on a planetary scale. The investigative aesthetics follows a speculative methodology to research the multiple layers of lithium as raw material

[299] Fuller and Weizman, *Investigative Aesthetics,* pp.14-15.
[300] Ibid., p, 18-21.
[301] Ibid., p. 21.
[302] Ibid., p. 26.
[303] Ibid., p, 50.
[304] Susan Schuppli. *Material Witness. Media, Forensics, Evidence* (The MIT Press, 2020), p. 9.

and as a resource in the world economy, paying particular attention to different technologies and vertical models of seeing to document, record, and analyse the traces left behind by the activity of lithium extraction taking place in this region. This ranges from extraction to sedimentation, from rural landscapes to toxicity and mining waste, from ecology to industry, the technologies it uses to refine, industrialise, produce and trade, and the consequent displacement of matter and people. Here I use recording methods of investigative aesthetics and archaeology (practices of visualisation and of documentation) to create drone imagery, photography, object analysis, sculptures, and three-dimensional counter-maps (real and imaginary) of the landscape transformation to document change in Covas do Barroso.

Following Robert Smithson's spatial practice in Passaic,[305] my journey to Covas do Barroso[306] presents the landscape as I saw it, blurring reality and fiction to open up a new direction for understanding key contemporary issues through the act of walking as a 'critical mode of enquiry'.[307] The speculative and imaginative nature of the act of walking, together with site-writing, allows me to explore how the spatial and material qualities of a site can be transmediated into writing.[308] It emphasises the role of imaginative thinking in creating knowledge to track social change, and discovering details of our surroundings that develop a form of spatial proposition, an experimental practice which allows interchange between practice and theory, criticism and creativity. This shift between practical and theoretical methodologies to combine scientific enquiry with artistic expression is key to addressing the research questions, as it offers new ways of producing knowledge and engaging with landscapes.

In the following visual essay, I shift from the geological to the city and employ site-walking (investigative aesthetics) with archival research and visual documentation to study 'colonial geology' through examples of urban spatial injustice to critically reflect on the ways colonial power and urban policies rendered some communities as 'disposable' by exposing processes that devalued them. The visual essay focuses on the SAAL Project in Oeiras, and I refer to the Pedreira dos Húngaros neighbourhood to demonstrate the

[305] Robert Smithson, 'A Tour of the Monuments of Passaic, New Jersey', [Originally published as 'The Monuments of Passaic', *Artforum*, 6.4 (December 1967), pp. 52-57

[306] Visual essay 'Untold Climate Stories. Covas do Barroso: On Matter, Extractivism, Power, and Displacement', Chapter 2 of this thesis, pp. 57-64.

[307] Jaspar Joseph-Lester, *Walking Cities: London* (Routledge, 2000), p. 2.

[308] Architectural historian and writer Jane Rendell suggests 'to write sites rather than about sites' is the process that allows new configurations, memories, and dreams to enter the space of urban research.

historical devaluation of Black bodies[309] and spaces that dictate who has access to resources and affordable housing, and who has not. I reinforce my argument that colonial legacies render the 'other' (Blackness) as less valuable or deserving of resources (housing) by demonstrating that spatial injustice is linked to socio-ecological relations that render some places and some groups as 'worthless', and therefore 'disposable'.[310]

[309] Yusoff, *A Billion Black Anthropocenes*, pp. 76, 79.
[310] Marco Armiero, *Wasteocene. Stories from the Global Dump.* Elements in Environmental Humanities (Cambridge University Press, 2021), p. 10-11.

VISUAL ESSAY

The SAAL Project. On otherness and social justice.

Growing up in Oeiras (Portugal) after the 1974 military coup.

This visual essay examines 'practices of othering' in relation to unequal access to SAAL housing in the aftermath of the Portuguese military coup in 1974. Unlike other European countries, the Estado Novo regime did not withdraw from its African colonies in the aftermath of World War Two, as the Portuguese process of decolonisation was initiated only after the military coup in 1974. More than half a million Portuguese families 'returned' to the country between 1974-1976, mainly from Angola and Mozambique, and 'the Angola airbridge', on 31st August 1975, became known as the greatest exodus in African history.[1] The end of the Portuguese empire, the abrupt and unanticipated return of 'national migrants' to Portugal and the political, economic, and social challenges of their return created a profound social transformation in the country. One of the greatest political and social challenges was that of housing. Portugal had a housing crisis, and temporary measures were taken to accommodate the '*retornados*' (returnees) from 1975 onwards. The returnees arrived with empty hands and were sent to family homes, or hotels, prisons, campsites and other types of facilities that could accommodate the thousands of people arriving every day. This visual essay analyses the response of Oeiras municipality, in the suburbs of Lisbon, to the 1970s housing crisis by looking at the SAAL initiatives in Oeiras to uncover the colonial legacies and processes that created inequality in access to housing.

The SAAL Project.

Emerging from the social and political upheaval that took place after the April 25th 1974 Revolution, SAAL - Serviço Ambulatório de Apoio Local (Local Ambulatory Support Service) pioneered one of the most significant architectural and political experiments of the twentieth century by advocating the creation of 'brigades' directed by architects, which, in close collaboration with local communities, aimed to address the country's housing shortages and empower marginalised communities living in poor conditions. Rather than designing projects *for* the residents, the brigades collaborated *with* them by engaging residents in the design process, helping to form resident commissions (*comissões de moradores*), following up with processes of expropriating land, and documenting and improving living conditions based on local needs.

The SAAL experiment was set up in August 1974 by Nuno Portas, at the time the Secretary of State for Housing and City Planning, to provide support for the 25 per cent of the population who were living in conditions that did not meet the minimum standards of safety, health and privacy: these included shacks (*barracas*), decaying buildings, slums (*ilhas*), and overcrowded houses.[2] From the SAAL projects, only 13 per cent of the total number of lots were made available through acquisition or expropriation, and in some cases changes in the location and design team resulted in several proposals being entirely abandoned.

What we encounter today are fragments of SAAL, each of them with its own story, which in turn multiplies the stories of all involved.

The SAAL operations were utopian in nature. However, they generated a new model of participation that reshaped the way urban programmes (planning, projects and social support) were conducted, prompting architects to redefine their social and political role as designers, facilitators, and mediators in SAAL initiatives. The SAAL projects grouped several houses on the same location to strengthen community identity and resilience, which avoided land speculation and created a strategic plan that mitigated against displacement to peripheral areas.[3] The SAAL architectural practices favoured contexts over objectives, which were often expressed through human and dialectical aspects rather than through real objects, and thus they had a tendency to favour self-regulated systems of space organisation, implemented through the analytical tools of social practices.[4] The SAAL initiatives and outcomes thus depended on complex urban and social factors, varying from the *ilhas* in Porto and Lisbon to the self-constructed homes in Algarve.[5] The SAAL project continued for two years, until October 1976.

Oeiras.

The migration flux from Africa between 1974 and 1985 as a result of the decolonisation process tripled the number of slums in Oeiras. With fewer available houses and with a population without the financial resources to rent, the new constructions promoted by the municipality were insufficient at the time. It led to the illegal creation of clandestine neighbourhoods, including Pedreira dos Húngaros, Pedreira Italiana, o Marchante, o Casal das Chocas, and Ribeira da Lage.[6] The municipality of Oeiras had ten SAAL operations distributed over a vast territory that stretched from Paço de Arcos to Brandoa, and which envisaged the construction of around 2,500 homes for 8,500 people. The completed projects (e.g., Bairro 25 de Abril, Bairro 18 de Maio, and Bairro Luta pela Casa), the interdisciplinary approach adopted and the articulation between the different phases of social housing are examples of how SAAL's methodology has impacted the Oeiras municipal urban planning services.[7]

During my SPACEX secondment, I walked in three of the main SAAL projects in Oeiras, including the Bairro 18 de Maio, Bairro 25 de Abril, and Bairro Luta pela Casa. Although different in character, the three neighbourhoods presented the common features of SAAL projects, including low-rise buildings organized in clusters that foster community interaction, modular elements, flexible housing units adapted over time, and community spaces (e.g., a residents' association building, public gardens, communal areas and play areas). The three neighbourhoods are connected to the urban infrastructure, all located north towards the A5 motorway, a critical infrastructure that divides the city of Oeiras both geographically and socially. I also tried to visit and investigate in more detail the Bairro Pedreira dos Húngaros in Miraflores, known for housing more than three thousand people from Cabo Verde, Guinea-Bissau, and Mozambique for almost 30 years. I found it connected to SAAL but I found no details of what plans were made, what happened, or why it failed. The stark contrast between the neglected and now demolished Pedreira dos Húngaros (replaced by a new luxury development after the land was purchased

by Chinese investors in 2019) with the well-populated 'white' neighbourhoods with a strong sense of belonging touched on an important intersection of spatial justice, colonial history, and racial inequality in urban planning and housing.

By drawing attention to practices of othering in the SAAL Project that aimed to help marginalised communities to reclaim space/ housing after the Portuguese military coup, the study highlights the need to make visible these spatial injustices, linked to socio-ecological relations that often render places and people as 'worthless', and therefore 'disposable'.[8]

Figure 3.2. Portuguese people fleeing Angola and Mozambique at Lisbon airport, October 1975. © Abreu Morais & Mário Soares Foundation Archive – Permanent Exhibition Photographs, Folder 06278.00607.

Figure 3.3. Graffiti expressing the desire for better living conditions. '*Esta casa é do povo*' (This house belongs to the people)/ '*Casas sim, barracas não*' (Houses yes, shacks no); Figure 3.4. Maquette presentation, SAAL process for Páteo Vila Fernandes, Lisbon, by architects Manuel Tainha and Fernando Bagulho, 1976.Catarina Pires, 'Operacoes SAAL: Pode a Habitacao em Lisboa Aprender com este Sonho de Abril', *Mensagem de Lisboa,* 25 April 2023. <https://amensagem.pt/2023/04/25/operacoes-saal-habitacao-lisboa-sonho-de-abril> [accessed: 05 September 2024]


Figures 3.5-3.6. **Bairro 25 de Abril** was established in December 1974: 192 houses were built after July 1976.



Figures 3.7-3.9. A motorcycle parked near the house with an open door and clothes drying outside. Small architectural differences between the different clusters.



Figures 3.10-3.12. A plastic paddling pool and a bag left outside the only house I encountered with signs of neglect. Open space with vegetation between the different clusters.


Figures 3.13-3.14. **Bairro 18 de Maio** (18 de Maio neighbourhood) was established in December 1974. 450 houses were built after July 1976.



Figures 3.15-17. A series of narrow corridors between clusters.



Figures 3.18-20. Open green areas between the different clusters. All the houses are single storey with a small patio in front. Small architectural differences were observed (e.g., window size, entrance gates).


Figures 3.21-22. **Bairro A Luta pela Casa** (*The Fight for Housing neighbourhood*) was established in July 1975. 100 houses were built after April 1977.



Figures 3.23-25. The houses vary from one to two floors. People were observed sitting outside their homes.


Figures 3.26-3.27. The neighbourhood has several common areas, including a playground, football pitch, gardens and sitting areas.

Figures 3.28-3.29. The **Pedreira dos Húngaros** neighbourhood was demolished. Chinese investors purchased the land for 14.5 million euros in 2019 and a new luxury development is under construction; no access to the area was permitted.


Figures 3.30-3.31. Still images from 'Na Pedreira dos Húngaros', [YouTube video], *Historias de Vida* [9] picturing living conditions in Pedreira dos Húngaros. Unfinished buildings with rudimentary construction and a glimpse of children's lives in Pedreira dos Húngaros before it was completely demolished. (date unknown). Gipsy communities from Hungary started to occupy the land in the 1950s, giving the neighbourhood its name, Pedreira dos Húngaros (Hungarian quarry). The neighbourhood started to grow bigger after 1974 with the arrival of people from Cape Verde, S. Tome and Principe, Guinea-Bissau, Angola and Mozambique. More than 3000 people lived there in 578 *barracas* (shack constructions) The last was demolished in April 2003.[10]

ENDNOTES

1] The United States, USSR, United Kingdom, France, Germany and Belgium cooperated with Portugal to carry out 265 flights in September 1975. 'Angola's White Flight Reflects fears, but not of Black Anger', *New York Times*, August 31 1975 < www.nytimes.com/1975/08/31/archives/angolas-white-flight-reflects-fears-but-not-of-black-anger.html> [accessed: 26 October 2021].
António Gonçalves Ribeiro, *A Vertigem da Descolonização. Da Agonia do Êxodo à Cidadania Plena* (The Vertigo of Decolonization. From the Agony of the Exodus to Full Citizenship) (Mem Martins : Editorial Inquérito, 2002), pp. 414, 376.
2] Pierluigi Nicolin, Lotus Lotus International. NC 145 (March 2011) J. António Bandeirinha, *The SAAL Process. Thirty-five Years on. Models, Assessments and Upgrades*, Gulbenkian Archive: cota PAQT 55, pp 48-53.
3] Ibid, p. 51.
4] Nicolin; Bandeirinha, p. 52.

5] ‘The SAAL Process: Housing in Portugal 1974–76’, Exhibition at Canadian Centre for Architecture, Montreal, 12 May 2015 to 4 October 2015. Canadian Centre for Architecture, <https://www.cca.qc.ca/en/events/3501/the-saal-process-housing-in-portugal-197476> [accessed 8 June 2025].
6] Ricardo Santos, *Cidade Participada: Arquitectura and Democracy. Oeiras* Operações SAAL, Tinta da China, 2016), p. 153.
7] Ibid, p. 155.
8] Marco Armiero, *Wasteocene. Stories from the Global Dump.* Elements in Environmental Humanities. (Cambridge University Press, 2021), p. 10-11.
9] ‘Na Pedreira dos Húngaros’, [YouTube video], *Historias de Vida*, <www.youtube.com/watch?app=desktop&v=AYlBPYOuI7M>
10] Rita Neto, ‘Chineses compram terrenos de antigo bairro de lata em Oeiras por 14.5 milhões’ [The Chinese bought the land of former slums in Oeiras for 14.5 million] *SAPO,* 30th October 2019*,* <eco.sapo.pt/2019/10/30/chineses-compram-terrenos-de-antigo-bairro-de-lata-em-oeiras-por-145-milhoes/ > [accessed 4 September 2024].

CHAPTER 4

Waste Geographies.

On Waste Temporalities, Politics, Power, Toxicity, and Materiality.

> *Waste may be described as simultaneously a most harrowing problem and a most closely guarded secret of our times.*
>
> – Zygmunt Bauman, 2004:26.[311]

According to Jason Moore, the Anthropocene has two 'lives'[312]: one is entangled with the geological (the 'golden spike'), and the other relates to the relationship(s) between the human, the more-than-human, and nature. This chapter seeks to shift our attention from the geological debate to the lived experiences of people who live in, with, or around waste to examine how waste intersects with broader systems of power and inequality and explore waste as a 'flexible category rooted in social relations',[313] rather than just as a by-product of our desire to possess and accumulate things. By addressing how the global narratives of waste are translated into local 'wasting practices'[314] in order to deconstruct the ecologies of humans, non-humans, and their environments as an embodied layer of power and toxicity that creates uneven power relations of global economy, health inequality,[315] and (in) visible spatial injustice in the city,[316] I argue that the materiality of waste is racial, to critically demonstrate that the uneven impact and harm of 'toxic heritage'[317] across geographies influences the ways we perceive and engage with waste. If, as Michael Thomson and Joshua Reno suggest, value is a 'mutable social relation and

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[311] Zygmunt Bauman, *Wasted Lives. Modernity and its Outcasts* (Polity Press, 2004), p. 26.
[312] Jason W. Moore, 'The Rise of Cheap Nature' in Jason W. Moore (ed.), *Anthropocene or Capitalocene? Nature, History and the Crisis of Capitalism* (PM Press, 2016), pp. 28-1116.
[313] Gay Hawkins, *The Ethics of Waste. How we Relate to Rubbish (* Rowman & Littlefield, 2006). p. viii-ix.
[314] Armiero, *Wasteocene.*
[315] Melania Calestani, 'Toxic Legacies and Health Inequalities of the Anthropocene: Perspectives from the Margins', *Medicine Anthropology Theory*, 10.2, pp. 1–29, doi: 10.17157/mat.10.2.6914.
[316] Edward W. Soja, *Seeking Spatial Justice* (Minnesota University Press, 2010), p. 72.
[317] Tsing and others' idea of the 'patchy Anthropocene' and the writing of Ulrich Beck suggests that the impact of the hazards created by the 'risk society' is uneven across geographical boundaries. Dean Curran, 'Beck's Creative Challenge to Class Analysis: from the Rejection of Class to the Discovery of Risk-class', *Journal of Risk Research*, 21.1 (2018), pp. 29-40, p. 36, doi: 10.1080/13669877.2017.1351464, while Sarah May and Kryder-Reid address toxic heritage as a planetary phenomenon in their introduction text of their book: Sarah May and Elizabeth Kryder-Reid, *Toxic Heritage. Legacies, Futures, and Environmental Injustice.* (Routledge, 2024), p. 2.
Anna L. Tsing, Andrew Mathews and Nils Bubandt, 'Patchy Anthropocene: Landscape Structure, Multispecies History, and the Retooling of Anthropology', *Current Anthropology*, 60(S20) (2019), pp. 186-197, doi: 10.1086/703391.

not an inherent characteristic of things themselves,[318] and waste is not a fixed category of things, as identified by Hawkins,[319] how does waste intersect with broader systems of power and inequality? How can the materiality of waste and its temporality challenge established classification systems that create and destroy value? How can a deeper understanding of waste's 'temporal ontologies'[320] contribute to social change? Here I build on previous chapters of the thesis to highlight the way the West separates 'us' from 'the other' and human beings from nature in the late Anthropocene by focusing on the temporalities of waste (Viney, 2014; Allon, Barcan & Edison-Cogan, 2021) to reflect upon social stories of toxicity (Bennett, 2010; Tsing, 2019; Armiero, 2020) embodied in individual and structural 'biosocial processes' (Calestani, 2023)[321] as a way to identify toxic legacies (Armiero, 2020; Müller, 2023; May, 2024) and examine how we can navigate them to bridge the humanities and the science of sustainability. (Emilia Ferraro, 2013)[322] This study allows me to unpack the complex social, political, cultural, and environmental dimensions of waste to understand the unruly nature of waste and the impact of toxicity to shift from the geological to lived experiences to reflect the ways in which waste creates 'worthless' places, people, or things. These reflections will help me to articulate 'otherness as a creative framework' (ethics) to reflect on the impact of waste on urbanism, globalisation, and debates on sustainability, and how practice research can contribute to alternative futures that attempt spatial and material reconstitution.

The chapter follows Chua and Fair's perspective on 'the Anthropocene as a political and socio-economic problem and symptom of global inequalities and injustice',[323] and it is divided into three sections: 'Wastescapes as Sites of Violence', 'The Dynamic Materiality of Things: Framing Toxicity and "Thing-power"', and 'Losing the Right to Breathe. Waste Stories of Dumping' to build on my argument that waste is an ecological issue at a planetary scale but also has potential as a medium for creative transformation within urban

[318] Michael Thompson, (2017) *Rubbish Theory. The Creation and Destruction of Value.* (Pluto Press, 2017), p. 10.
[319] Hawkins, *The Ethics of Waste,* p. 2.
[320] Ibid., p. 88. Hawkins refers to 'temporal ontologies' to describe the material's capacity to actualise new temporal habits, dispositions, rhythms and routines embedded in everyday social practices.
[321] Calestani, 'Toxic Legacies and Health Inequalities of the Anthropocene', p. 4.
'Biosocial processes' means that biological and social phenomena shape human development and health. See also: Kallen M Harris and Thomas W. McDade, (2018) 'The Biosocial Approach to Human Development, Behavior, and Health Across the Life Course', *RSF.* 4.4 (2018), pp. 2-26, doi: 10.7758/RSF.2018.4.4.01.
[322] Emilia Ferraro and Louise Reid, 'On Sustainability and Materiality. Homo Faber, a New Approach', *Ecological Economics* 96 (December 2013), pp. 125-131, doi: 10.1016/j.ecolecon.2013.10.003.
Anthropologist Emilia Ferraro urges us to situate sustainable development debates within the realm of the arts and humanities.
[323] Liana Chua and Hannah Fair, 'Anthropocene', 2023, in Felix Stein (ed.), *The Open Encyclopedia of Anthropology*, 2019, Facsimile of the first edition in *The Cambridge Encyclopedia of Anthropology*. <https://www.anthroencyclopedia.com/entry/anthropocene>, doi: 10.29164/19anthro.

settings. The first section of the chapter, 'Wastescapes as Sites of Violence' explores the complex relationship between humans, non-humans, and the material remnants of their existence to examine how the discourses and practices of waste create and sustain patterns of social injustice by shaping our social structures, relations, perception, and values. It draws from Marco Armiero's concept of the Wasteocene, Sarah May's 'toxic heritage',[324] and Müller's work on 'toxic timescapes' to discuss the scope, impact, and uneven distribution of toxicity across geographies and how harmful contaminants permeate time and space, producing more-than-human narratives. The second section 'The Dynamic Materiality of Things: Framing toxicity and "thing-power"' draws from Jane Bennett's concept of 'vibrant matter' to examine waste's intrinsic vitality or 'liveliness',[325] and from Gay Hawkins' work on the ethical dimensions of our interactions with waste to discuss how we engage and relate to waste as a phenomenological interaction with its materiality. The third section of the chapter, a visual essay titled 'Losing the Right to Breathe. Waste Stories of Dumping' builds on the previous section to investigate power dynamics and the colonial legacies that separate human and nature in Langøya, to consider ways in which waste may challenge dominant narratives, and to reflect on waste's potential for transformation. Here I focus on ruins of modernity[326] as a by-product of (injust) socio-ecological relationships[327] that are often normalised through neoliberal discourse.

Waste is at the core of material culture.[328] In her proposal that dirt is 'matter out of place', essentially 'disorder',[329] Mary Douglas shows that waste is not a 'fixed category of things'[330] but 'a by-product of ordering and classification systems of matter on the world'.[331] Douglas's spatial conception of waste has been vital to understand the symbolic and social dimensions of the material organisation of 'dirt' in all societies.[332] Her distinction between cleanliness and dirt demonstrates that dirt is not inherently problematic; it becomes so when it disrupts the established systems of order of a given society. In that sense, the cultural norms essentially related to the way societies organise things in space reflect the

[324] May and Kryder-Reid, *Toxic Heritage*, p. 2.
[325] Jane Bennett, *Vibrant Matter. A Political Ecology of Things.* (Duke University Press, 2010), p. xvi.
[326] Julia Hell and Andreas Schönle, *Ruins of Modernity* (Duke University Press, 2010).
[327] Armiero, *Wasteocene.*
[328] Mark Higgin, 'The Other Side of Society. Reflections on Waste and its Place', *Antropologia* 3.1,n.s.(2016), pp. 69-88, doi: 10.14672/ada2016436%25p.
[329] Mary Douglas, *Purity and Danger: An Analysis of Concepts of Pollution and Taboo* [1966], (Routledge, 2002), pp. 36, 2.
[330] Hawkins, *The Ethics of Waste*, p. 2.
[331] Douglas, *Purity and Danger,* p. 36, 44. 'Dirt is a by-product of a systemic ordering and classification of matter, in so far as ordering involves rejecting inappropriate elements'.
[332] Ibid., p. 36. 'Where there is dirt there is a system'.

entanglement of waste with cultural rituals, symbolic meanings, and social behaviours toward consumption, value, and power dynamics, or, as Hawkins observes, 'an economy dependent on disposability'.[333] In her book *Purity and Danger*, Douglas demonstrates the classification systems that are present in our daily lives by analysing how things become rejected and why waste came to exist. By observing polluting behaviours, she concludes that 'dirt exists in the eye of the beholder'[334] and that the practices of 'cleansing, described as a ritualistic response to dirt, include sorting and classifying the pure from the impure, as a way of re-ordering the environment'.[335]

An important example of these rituals of 're-ordering' can be found in the longstanding cultural and religious traditions of the nineteenth century: 'Spring cleaning' is a yearly ritual when people open their doors and windows to clean their homes from dust. Rooted mainly in traditions from the Middle East and China, Spring cleaning took on a new resonance after the French scientist Louis Pasteur's research demonstrated that invisible germs were a source of infection, ideas strengthened in the 1880s and '90s by the German scientist Robert Koch who, identified the specific germs that are responsible for diseases such as tuberculosis and cholera.[336] At the beginning of the twentieth century, the British engineer Hubert Cecil Booth revolutionised the cleaning of rich Londoners' homes by developing the first powered vacuum cleaner, a machine that would suck, not blow, dirt.[337] Although Douglas's contribution to the anthropological study of waste was not focused on these hygiene practices of the time, but rather in the classification systems that place value on what is either accepted or rejected,[338] it is important to note that these material practices at the time reflected class and gender divisions and demonstrate that waste emphasises spatial inequalities within the city through power (wealth) and everyday practices of waste: access to clean domestic spaces was less available to the poor, as they could not afford vacuum cleaners.[339]

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[333] Hawkins, *The Ethics of Waste,* p. 2.
[334] Douglas, *Purity and Danger*, p. 2.
[335] Fiona Allon, Ruth Barcan and Karma Edison-Cogan (eds.), *Temporalities of Waste. Out of Sight, Out of Time* (Routledge, 2021), p. 23.
[336] 'National Clean Up Weeks: A History of Spring Cleaning to Improve Public Health', n.d. Johnson & Johnson Archives, <https://ourstory.jnj.com/taxonomy/term/502> [accessed: 05 February 2024].
[337] 'The Invention of the Vacuum Cleaner, from Horse-drawn to High Tech', Science Museum, n.d., <www.sciencemuseum.org.uk/objects-and-stories/everyday-wonders/invention-vacuum-cleaner> [accessed 05 February 2024].
[338] Douglas, *Purity and Danger,* p. 36.
[339] Spatial inequalities within the city in relation to housing were also addressed in relation to the migration flux that took place in Portugal following the 1974 military coup – see the visual essay 'The SAAL Project. On otherness and social justice. Growing up in Oeiras (Portugal) after the 1974 military coup', Chapter 3 of this thesis, pp. 77-84.

Figure 4.1. Johnson & Johnson's *Red Cross Messenger* for retail pharmacists and *Red Cross Notes*, the company's scientific journal. Johnson & Johnson Archives.
ourstory.jnj.com/taxonomy/term/502 [accessed: 20 January 2024]
Figure 4.2. Booth's vacuum cleaner being demonstrated 1903. Science Museum Group Collection.
www.sciencemuseum.org.uk/objects-and-stories/everyday-wonders/invention-vacuum-cleaner [accessed: 05 February 2024]

The value of spatial and temporal enquiry to examine how we experience and narrate waste is evident. William Viney highlights this idea in a beautiful way by arguing that the concept of waste is also grounded in temporality – waste is 'matter out of time'.[340] In his book *Waste. A Philosophy of Things,* Viney suggests the idea of 'waste time' as a way in which concepts of waste and time intersect by arguing that 'the value of things is defined by the times of use and waste that we assign them'. This transition between use and waste (or use and non-use), according to Viney, can be traced through narratives that 'affect, broker and maintain' the divergent times we distribute to things'[341]; the duration of use-time depends thus upon different variables, such as the type of object, its functions, its scarcity, and who or what uses it. In that sense, 'use-time' is bounded with a 'sense of futurity',[342] which expresses the potential of an object's 'usefulness'.[343] By acknowledging the time we assign to the things that surround us, we recognise time's central position to an understanding of waste and 'its power to organise notions of wearing, decay, transience, and dissolution'.[344] As already mentioned, 'use-time' is bounded with a *sense of futurity*,[345] and it expresses the potential of an object "usefulness".[346] Viney's approach to

[340] William Viney, *Waste. A Philosophy of Things* (Bloomsbury Publishing,2014), pp. 2, 19.
[341] Ibid., p. 5.
[342] Ibid., p. 7, 9.
[343] Ibid., p. 9.
[344] Ibid., p. 3: 'Waste frequently requires a sense of how time has somehow passed, paused or is no longer available to us through the things that surround us. (...) With our recognition of waste comes an acknowledgement of time passing, its power to organize notions of wearing, decay, transience and dissolution and its power to expose that organizing function, to disclose how things are imbued with a sense of duration, punctuation, and intermission that makes time an explicit, tangible thing of thought.'
[345] Ibid., pp. 7, 9.
[346] Ibid., p. 9.

use-time reinforces my argument in the thesis that waste is a critical material with which to rethink urban development and advance spatial justice by addressing the urgency for the potential of waste to be reimagined with another function or purpose that reveals, disrupts, and challenges its temporality. This idea is key to understanding Thompson's and Reno's idea that value is not an intrinsic characteristic of things[347] and that objects can shift from categories of value[348] in which rubbish acts as a 'zero degree of value' as it enables the possibility for transformation in use and value;[349] furthermore, rejecting the 'throw-away' approach opens up space to consider new ways to reinscribe waste with value in an attempt to challenge the linear perception of waste, as waste affects some social groups more than others[350] and 'is not truly disposable'.[351]

I. *Wastescapes as Sites of Violence*

> *Pollution is not a manifestation or side effect of colonialism but is rather an enactment of ongoing colonial relations to Land.*
>
> — Max Liboiron, 2021:6[352]

Wastescapes are sites of violence.[353] Environmental humanities scholar Marco Armiero has clearly articulated this idea by suggesting the term 'Wasteocene' for the embodied stratigraphy of power and toxicity that is transforming the environment into a huge dump.[354] Armiero argues that the Wasteocene revolves around determining the value of things and examines wasting as a social process that perpetuates class, race, and gender inequalities.[355] By framing 'waste as wasting', a socio-ecological relation that renders someone or something disposable,[356] Armiero emphasises the global impact of waste and

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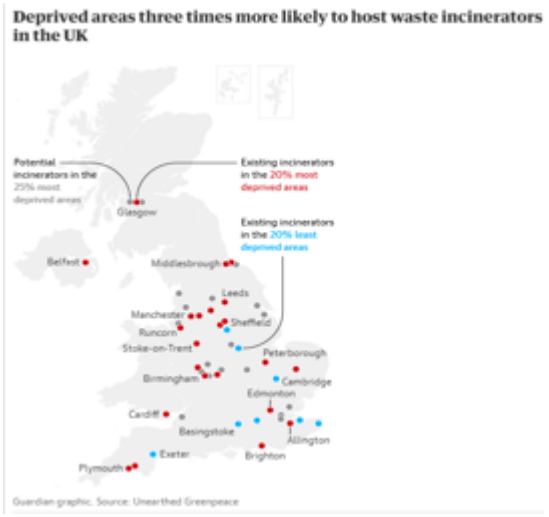
[347] Thompson, *Rubbish Theory*, p. 10; Joshua Reno, 'Your Trash is Someone's Treasure: The Politics of Value at a Michigan Landfill', *Journal of Material Culture*, 14.1 (2009), pp. 29-46, doi: 10.1177/1359183508100007.
[348] Thompson, *Rubbish Theory*, pp. 4-5.
[349] Hawkins, *The Ethics of Waste*, p. 79.
[350] Ulrich Beck, quoted in Deborah Lupton, *Risk* (Routledge, 1999), p. 70.
[351] Reno, 'Your Trash is Someone's Treasure'.
[352] Max Liboiron, *Pollution is Colonialism* (Duke University Press, 2021), p. 6.
[353] The sentence draws from Max Liboiron's idea that 'pollution is colonialism',and seeks to engage us in Marco Armiero's perspective of the Wasteocene as a way to address the ecologies of humans in their entanglements with the environment.
[354] Armiero, *Wasteocene,* pp. 2, 9-10.
[355] Ibid., p. 10.
[356] Ibid, pp. 10-11.

its interconnectedness with colonial histories[357] by drawing attention to ‘wasting lines’, or ‘lines of privilege’: for Sara May and Elizabeth Kryder-Reid,[358] this refers to the uneven exposure to harmful substances, illness, and living conditions surrounded by global waste. If the process of ‘othering’ someone or something through wasting lines creates a safe and worthy ‘us’, as noted by both Rebecca Solnit and Armiero,[359] then I argue that we should address the materiality of waste as racial because its socio-ecological metabolism, characterised by class, race, and gender inequalities, is at the heart of a system that produces security, health, and wealth by marginalising and excluding some individuals.[360] Understanding wastescapes as ‘sites of violence’ allows us to acknowledge waste’s invisible connections and the socio-ecological injustices that cause them. Consequently, only by addressing the materiality of waste as racial can we dismantle the processes of othering used for capitalist accumulation.[361]

Thinking about wasting lines in the context of the COVID-19 pandemic, for example, which were supposed to protect ‘us’ from a contaminated, sick, and threatening ‘them’, revealed ‘toxic narratives’ that normalise and make invisible the Wasteocene order, or the project of othering, not because of the separation of health and contaminated people or places, but because it has revealed the unjust socio-ecological relationships that determine who and what has value, through access to vaccines, health care, or even salary compensation. By addressing waste as racial I seek to gain a better understanding of the potential impact of human waste practices on landscapes, communities, and life on Earth.

[357] Armiero; Ilenia Iengo, ‘Toxic Bios. Traversing Toxic Landscapes through Corporeal Storytelling’, in Simone Müller and others, *Toxic Timescapes. Examining Toxicity across Time and Space.* (Ohio University Press, 2023), pp. 187-211 (p.188).
[358] May and Kryder-Reid, *Toxic Heritage,* pp. 2-3.
[359] Rebecca Solnit, cited in Armiero, *Wasteocene,* pp. 10, 31.
[360] Armiero, *Wasteocene,* pp. 10-11.
[361] Ibid., p. 38.



(Top) Figure 4.3. Satellite image of Covas do Barroso, 2021; Figure 4.4. Langøya, 1970s. (ref. _DSC0862) Repro: Morten Flaten, 2023 © Slemmestad bibliotek/Cementmuseum/Geologisenter.
(Bottom) Figure 4.5. Unearthed Greenpeace, Graph "Deprived areas three times more likely to host waste incinerators in the UK" in Sandra Laville, 'UK Waste Incinerators Three Times More Likely to be in Deprived Areas', *Guardian,* 31 July 2020; Figure 4.6. Marisa Ferreira, *Spaces of Otherness*, Porto, 2023.

These aerial photographs and diagrams demonstrate that 'expanding human modes of extraction, production, and disposal' to support capitalist governments' drive for economic growth create large amounts of waste, which constitutes a significant source of wasting relationships and of contamination as it promotes 'toxicity presence in our air, water, and soil'.[362] Building on Anna L. Tsing's concept of the 'patchy Anthropocene', which examines the scope and scale of toxicity as well as the unevenness of its effects across lines of social inequality, May and Kryder-Reid argue that 'toxic heritage is a planetary phenomenon' by recognising that its harmful socio-ecological impact transcends geopolitical boundaries, leaving no-one unaffected by human impact on the planet.[363]

[362] Müller and others, *Toxic Timescapes,* pp. 3-4.
[363] May and Kryder-Reid, *Toxic Heritage*, p. 2.

In their book *Toxic Heritage. Legacies, Futures, and Environmental Injustice*, May and Kryder-Reid propose the concept of 'toxic heritage' to think about places of 'environmental harm as a heritage',[364] a counternarrative that makes socio-ecological harmful toxic legacies visible and that 'reconfigures toxicity' as a socio-material process, an epistemic concept, and an embodied experience.[365] By combining the notions of heritage and toxicity as both a material phenomenon and a critical part of the historical conditions that brought about the current environmental crisis – extractivism, carbon-based economies, environmental racism, settler-colonialism, and geopolitical exploitation,[366] May and Kryder-Reid aim to engage public audiences in the complex history of environmental harm and with 'heritage as a set of practices', and its consequences today, to think about possibilities for a more just and sustainable future.[367] This requires us to understand the overlapping and interconnected multiplicity of scales (spatial and temporal) of the poisoning of our planet in order to draw connections across scales of impact – cells, bodies, families, communities, ecosystems, nations, oceans, and planet, while paying attention to parallel scales of entangled social and economic relations.[368] Looking at structural racism and political economy, while challenging established concepts of race, class, and gender, is, then, crucial to foster critical engagement with pasts that leave toxic legacies to analyse how the past is remembered, or erased, in toxic narratives of lived experiences, memory practices, and public discourse[369] to highlight environmental injustice and social inequality, and to advocate for more equitable and just futures.

Figure 4.7. Langøya before the dumping of waste in one of its craters. (N/A) © NOAH. https://www.noah.no/investering-i-ny-behandlingsteknologi-kan-gi-industrien-forlenget-avfallskapasitet-pa-langoya/ [accessed: 12 August 2024].

Figure 4.8. Langøya with visible fluid toxicants. *Isachsen skal tette deponi for NOAH på Langøya*. (23/11/2015). Tungt. © Tung.no/ NOAH. https://www.tungt.no/article/view/756137/isachsen_skal_tette_deponi_for_noah_pa_langoya [accessed: 12 August 2024].

[364] Ibid., pp. 7, 343.
[365] Ibid., p. 344.
[366] Ibid., p. 343.
[367] Ibid., p. 7.
[368] Ibid., p. 3.
[369] Ibid., pp. 7, 345.

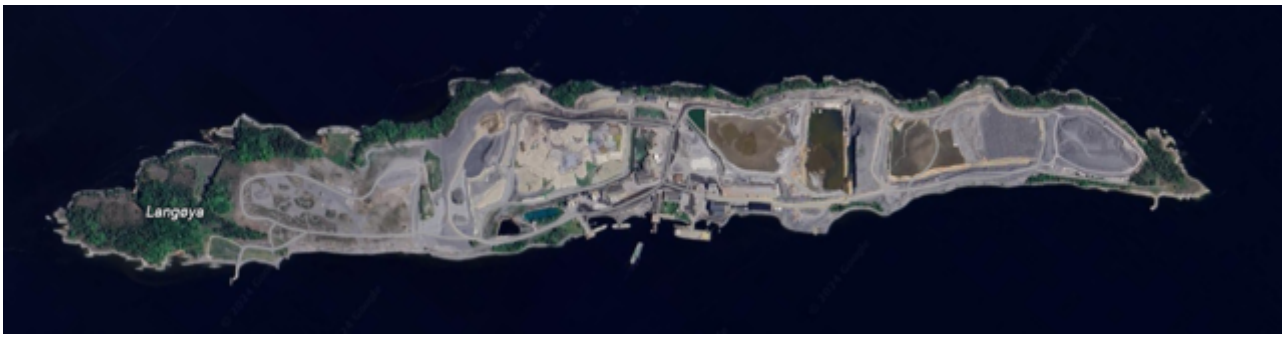


Figure 4.9. Google Earth version 10.61.0.4 (2024) Satellite view of Langøya, 59°29′37″N 10°22′57″Ø. https://earth.google.com/web/@59.49239537,10.3843334,3.5033979a [accessed: 12 August 2024].

Scholars writing on waste often point to Naples as a case study to discuss the living experiences of toxic legacies and (illegal) dumping narratives. I will go further north and reflect on toxic legacies and more-than-human narratives through the case study of Langøya. Langøya is a Norwegian island in the Vestfold area of the Holmestrand municipality, located in Holmestrand Fjord, southwest of Oslo. The island is around 3000 metres long and 500 metres wide, 40 metres beneath the sea, and is uninhabited. Langøya was a limestone quarry with two large craters for a century before becoming a waste treatment and disposal facility. With an annual production of 1.6 million tonnes, Langøya limestone was used by Christiania Portland Cement (Norcem) as raw material for their cement factory in Slemmestad. The quarry operated between 1899 and 1985, and it is known as one of Norway's largest limestone quarries. Since the 1980s, NOAH has filled its craters with hazardous waste – primarily metal-polluted plaster (CaSO4), as well as inorganic production waste and hazardous waste generated by industrial activities in the country.[370]

The history of Langøya demonstrates how the capitalist approach of mining industries is often led by a colonial mindset that separates humans from nature to justify the exploitation of its resources[371] and harmful toxic legacies. The inorganic toxic waste that now fills the island may pose long-term health and ecological threats, causing contamination, leaching or other types of pollution, while also demonstrating how waste as 'matter out of place'[372] is entangled with multiple forms of life.[373] Even with the environmental and resource company NOAH's process of gradually restoring the

[370] A. Westvang, 'Langøya – øy i Holmestrand [Langøya: Island in Holmestrand']*, Store Norske Leksikon* [Great Norwegian Encyclopedia] (n.d.). https://snl.no/Lang%C3%B8ya_-_%C3%B8y_i_Holmestrand [accessed 05 August 2024].
[371] Max Liboiron, *Pollution is Colonialism* (Duke University Press, 2021).
[372] Douglas, *Purity and Danger*, p. 44.
[373] Joshua Reno, 'Toward a New Theory of Waste: From "Matter Out of Place" to Signs of Life"', *Theory, Culture and Society* 31.6 (2014), pp.3-27, doi: 10.1177/0263276413500999.

landscape of Langøya,[374] toxic contaminants are never static,[375] as they can change from a fluid to solid state; they can also mark landscapes and alter human health for generations or centuries to come.[376]

The dumping of waste on the seabed has a long history. Since the 1960s and 1970s several mining companies found it easier and cheaper to dispose of rock waste and mine tailings in the marine environment rather than managing them on land. The mining of metals and minerals covers the extraction of low percentages of the ore, causing a large volume of waste material. Waste disposal in the seabed includes both the direct dumping of waste rock and the discharge of tailings via pipelines into the sea (Deep Sea Tailings Placement - DSTP).[377] The countries that have been carrying out sea-dumping of mining waste in the past thirty-five years include Norway, Canada, the USA (Alaska), Greenland, Turkey, Indonesia, Philippines and Papua New Guinea.[378] The London Convention was one of the first global conventions to protect the marine environment from human activities and has been in force since 1975. However, Norway, for example, has implemented no prohibitions on dumping mine tailings in the sea,[379] and Norway alone has more than twenty registered locations where sea-dumping has been practised[380]: the long-term impact of these on marine environmental and coastal communities is unknown, due to the lack of scientific data and the ever-changing nature of toxicity, contamination, pollution, and modes of exposure.[381] Simone Müller and others suggest 'toxic timescapes' as a tool of analysis to create data, conceptualise the historical presence and the potential effects of harmful toxicants, as well as offering a framework for new ways to narrate toxicity as part of the complex web of life.[382] She argues that just as toxicants can transition from a fluid to a solid state, and act as 'disruptors', they may also be able to affect human and non-human well-being, including that of those who are not yet born.[383] If toxicity, pollution, and modes of exposure are never static,[384] how do transformations occur?

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[374] ''Langøya', NOAH,<https://en.noah.no/for-clients/treatment-area/langoya> [accessed 8 June 2025].
[375] Müller, *Toxic Timescapes,* p. 6.
[376] Ibid., p. 5.
[377] Jenny Stauber and others, (2022) 'A Generic Environmental Risk Assessment Framework for Deep-sea Tailings Placement', *Science of The Total Environment*, 845.157311 (2022), doi: 10.1016/j.scitotenv.2022.157311.
[378] Jens Skei and others, *Mining Industry and Tailings Disposal*. *Status, Environmental Challenges and Gaps of Knowledge,* Report M-1335 2010/2019 (Norwegian Environment Agency [Miljodirektoratet], 2019), p. 36. <www.miljodirektoratet.no/globalassets/publikasjoner/m1335/m1335.pdf> [accessed 15 August 2024]
[379] Ibid., p.39.
[380] Kvassnes and others, 2009, quoted in Jens and others, *Mining Industry and Tailings Disposal*, p. 38.
[381] Müller and others, *Toxic Timescapes*, p. 6.
[382] Ibid.
[383] Ibid., p. 5.
[384] Ibid., p. 6.

II. The Dynamic Materiality of Things: Framing Toxicity and 'Thing-power'[385]

> *Materials are not "born" to be waste: they are transformed into waste by identifiable material and social processes.*
>
> – Zsuzsa Gille, quoted by Susan Morrison, 2013:8[386]

Toxicity demonstrates the unruly agency of matter.[387] Tsing's idea of 'contamination as collaboration',[388] in which transformation happens through encounters, resonates with Jane Bennett's idea of 'vital materialism'. Bennett argues that all bodies are intertwined in a complex web of interactions because materiality possesses an inherent 'vitality' that affects other bodies, either by amplifying or lessening their power[389] through an 'assemblage'.[390] By acknowledging the deep interconnectedness between human and non-human bodies, Bennett's theory of vital materialism recognises the political agentic contributions of the non-human world ('thing-power') as lively and self-organising,[391] figured less as social constructions[392] and more as, in Bruno Latour's term, 'actants' whose material powers (rather than objects) are capable of affecting other bodies. Equal powers are granted by this constant process of affecting and being affected by other bodies (the ability to act and the ability to perform action),[393] but it is important to highlight that 'assemblages' (groups of vibrant materials of all sorts) are an 'open-ended collective' with uneven topographies, as no materiality can define the trajectory or impact of the group, as power is not distributed equally across its surface.[394] In that sense, and as Robert Sullivan points out in his demonstration of the vitality of rubbish, it is impossible to truly discard vital materiality, because it continues its activity even when the commodity becomes unwanted,

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[385] " Power-thing" is a term used by Jane Bennett in her theory of vital materialism. Jane Bennett, *Vibrant Matter. A Political Ecology of Things* (Duke University Press, 2010).
[386] Susan Signe Morrison, *Waste Aesthetics: Form as Restitution. Interdisciplinary Studies in Literature and Environment* (Oxford University Press, 2013), p. 8.
[387] Bennett, *Vibrant Matter,* p. 3: 'Things do in fact affect other bodies, enhancing or weakening their power.'
[388] Anna L. Tsing, *The Mushroom at the End of the World. On the Possibility of Life in Capitalist Ruins* (Princeton University Press, 2015), p. 27.
[389] Bennett, *Vibrant Matter*, pp. 11, 13. Bennett uses the term 'vitality' to describe a thing's ability to function as an agent or force with independent tendencies or trajectories, as described in the book preface, p. viii.
[390] Ibid., p. 23.
[391] Ibid., pp. Xxvi-xvii, 10.
[392] Ibid., p. 21.
[393] Ibid., pp. x, 21. Bennett refers to Spinoza's idea of 'conative bodies' ('that strive to enhance their power of activity by forming alliances with other bodies') as associative or social, as bodies are continuously affecting and being affected by other bodies, and that those have equal powers (acting or suffering action), as suggested by Deleuze.
[394] Ibid., p. 24.

discarded or dumped.[395] The locus of ethical and political responsibility must, then, be a 'human-nonhuman assemblage' as suggested by Bennett,[396] because vital materialism acknowledges human bodies as an 'array of bodies',[397] also composed of microbiomes, or, in Latour's words, 'actants more than objects' (waste, bacteria, food, metals, technologies, stem cells),[398] that rejects the withdrawal of the cultural from the natural.[399]

If this intrinsically inanimate power is one of the impediments to the emergence of more ecological and sustainable modes of production and consumption, as Bennett suggests in her preface,[400] then what is preventing us from acknowledging waste ('vibrant matter') as a valuable resource for art production? I argue that a material reorientation is necessary to the pursuit of spatial justice through the materiality of waste. To do this I follow Gay Hawkins's proposal that we should think about 'waste as things'.[401] Hawkins recognises Thompson's categories of value,[402] but she argues that the transition between the categories of 'rubbish' to another system of value requires us to acknowledge waste as 'vital matter' open to reconstitution.[403] Rethinking waste beyond environmentalism and repurposing waste as raw material for art production might entail reconsidering everyday practices that prevent us from perceiving the possibilities and realities of 'what is left', and change our relation to the 'things' (waste materials) that we don't see.

Embodied practices of waste disposal cultivate sensibilities and sensual relations with the world in a process of reflexivity about the way people live.[404] This means that addressing the 'ethico-political' dilemma of waste, as defined by Hawkins, requires that we rethink all practices that prevent us from imagining a new materialism capable of transforming our relations with waste matter.[405] Consequently, this makes me think about what kind of ethical and aesthetic speculations, object narratives or even values, we have to support in order to acknowledge the capacity of waste for ongoing reclassification, which enables us

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[395] Robert Sullivan, *The Meadowlands: Wilderness Adventures on the Edge of a City* (Doubleday,1998), p. 96-97. Sullivan is quoted by Jane Bennett about this in her book *Vibrant Matter,* p.6.
[396] Bennett, *Vibrant Matter,* pp. 36-37.
[397] Ibid., pp. 112-113.
[398] Ibid., p. 115.
[399] Ibid., p. 116.
[400] Ibid., p. ix.
[401] Hawkins, *The Ethics of Waste,* p. 73.
[402] Ibid., p. 78.
[403] Ibid., p. 80.
[404] Hawkins, *The Ethics of Waste*, p. 5. The familiar slogan 'Think globally, act locally' (often attributed to the environmentalist David Brower as a slogan for Friends of the Earth, the UK organisation he co-founded in 1969), as well as the rise of governmental campaigns inviting us to 'reduce, reuse, recycle', have also opened up new ways of thinking about waste, while also addressing waste as a flexible category grounded in social relations, with meanings that vary depending on the context and historical use.
[405] Ibid, p. 81.

to recognize waste's materiality as 'vital matter' open to reconstitution[406] throughout the creative art process. As expressed before, and aligned with Bennett's idea of 'enchantment',[407] this process of reflexivity that involves the self by imposing ethical and aesthetic order[408] creates new ways of thinking about waste, which move away from the idea of waste as a dead, polluting object towards waste as 'vital matter' with agency that is 'part of the environment and has the capacity to bear witness, while being constantly open for transformation'.[409] By moving away from the burden of waste and the critique of the excesses of capitalism, our social conscience may start to look for a different type of materialism. Furthermore, this shift from waste as an environmental and social issue that creates unjust geographies towards waste as a resource for art production might enable us to challenge waste practices through an ongoing process of reflexivity capable of producing embodied sensibilities, meaningful affects, and new meanings that may vary depending on the context and historical use.

However, as Hawkins argues, it would be impossible to engage people in this process of reflexivity without asking them about the way they live.[410] This leads me to my research question: how can the experience of otherness be reimagined, and how can the process of reimagining otherness itself be a process of reflexivity in which I use practice research to challenge and change current waste practices? By reflecting on the ways I developed my PhD research, I propose 'otherness as a creative framework' to unveil and challenge practices of othering and reimagine Edensor's 'subversive potential' of waste as a valuable resource for urban transformation that attempts spatial justice. The diagram below seeks to challenge the linear perceptions of waste to reflect on new ways to navigate and engage with waste.

[406] Ibid., p. 80.
[407] Jane Bennett's notion of 'enchantment' is linked to material metamorphoses, and its potential radical shifts in meaning and matter.
[408] Hawkins, *The Ethics of Waste*, p. 4.
[409] Ibid., p. 90.
[410] Ibid., p. 5.

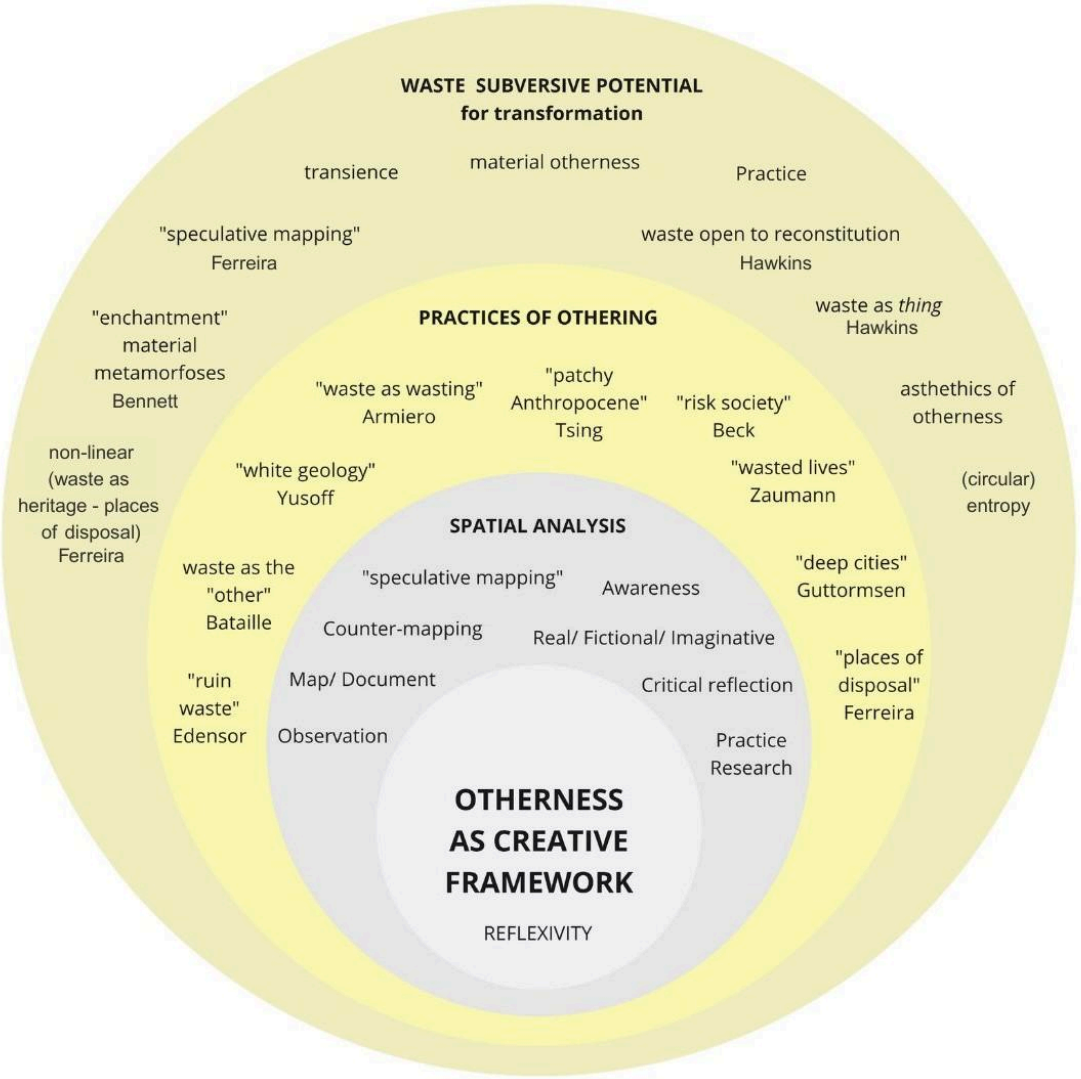

Diagram 2. **Otherness as a creative framework.**

Otherness as a creative framework is a process of reflexivity that uncovers practices of othering and challenges them by developing creative and speculative methods that transform waste into a valuable resource in an attempt to enable material and spatial reconstitution. It develops in three phases: stage 1 – observation, mapping, and awareness of spatial injustice; stage 2 – critical thinking to challenge social norms and uneven power dynamics, and stage 3 – creative and speculative methods to reimagine ways that waste can be reused, recycled, repurposed, and valued as a crucial element in reshaping urban landscapes. Together these stages will lead to action and change in cities undergoing urban regeneration. This process and the capacity to reimagine, disrupt, and transform waste creates new ways of living with or adapting to things that challenge the boundaries between human / non-human / nature and has the potential to inspire others to engage with the materiality of waste in new ways and for new approaches to living together.

VISUAL ESSAY

Losing the right to breathe.

Waste stories of dumping.

The Earth is undergoing a period of intense techno-scientific transformations. If no remedy is found, the ecological disequilibrium this has generated will ultimately threaten the continuation of life on the planet's surface.

– Felix Guattari, 2000.[1]

Trash can be both matter out of place and also 'matter making place'.

– Thomas Hylland Eriksen, 2017.

This visual essay is based in Langøya, a former limestone quarry and now a toxic waste dump in the Oslo fjord. It reflects on power dynamics and the colonial legacies that separate humans and nature and considers ways in which waste may challenge dominant narratives to reflect on waste's potential for transformation. It addresses the idea of waste as 'matter making place' (Thomas Hylland, 2017) to demonstrate the interconnectedness of the extraction of natural resources, industrialisation, urbanisation, and globalisation, and builds on the argument in the thesis that waste has the capacity to both trace violence and be transformed into new uses in urban development.

Part I. Material traces of violence.

Langøya is a Norwegian island located in Holmestrandsfjord, south-west of Oslo. The island is around 3000 metres long and 500 metres wide, 40 metres beneath the sea, and is uninhabited. Its landscape offers a re-written history through the transformation of its geological layers to meet the needs of a growing urbanisation and of Christiania Portland Cement (later Norcem), who bought the Langøya island in 1895 to carry out limestone extraction from 1899 until 1985 for use in cement production. More than a hundred people lived in Langøya; the island had its own school (1956) and a railway to transport the limestone from the quarry to the crushing plant.[3] In the thirty years after 1985, the quarry craters were filled with hazardous waste, primarily metal-polluted plaster, as well as some inorganic hazardous waste generated by industrial activities,[4] delivered to Langøya by more than seventy different Norwegian companies.[5] Currently, there is a series of reforestation initiatives that attempt to create another narrative more linked to ecological restoration and a sense of hope. The craters are sealed, and when the landfill operations end in 2025 the northern part of the island and along the coast to the east will be a nature reserve with protected flora and

rich deposits of fossils and the southern part will become a lagoon.

Aligned with Edward Said's 'counter-cartography' as resistance to the mapping of colonial legacies, these images, sourced from digital archives and through satellite imagery (as the island is not yet accessible) tell a story that links the colonial mindset that separates human and non-human lives from nature to justify the exploitation of natural resources[6] and the dumping of toxic matter. This creates spaces that reveal the embodied stratigraphy of power and toxicity, which transform Langøya into a repository that creates and perpetuates inequality.[7] They also demonstrate that the erasure of non-human lives and environmental destruction resulting from capitalist progress and growth neglects the importance that non-human and more-than-human actors play in preventing 'socio-ecological catastrophe'.[8]

If we consider Gay Hawkins' suggestion of waste's material potential to be transformed into a 'thing', then we need to acknowledge the ruins of Langøya not a passive entity, subject to external processes, but as a living organism transformed into an 'active hybrid' (Latour) of nature and culture that results from the action and impact of biological, cultural, economic, and political orders.[9] These permeate time and space, produce more-than-human narratives and pose long-term health and ecological threats, while also demonstrating how waste, as 'matter out of place',[10] is entangled with multiple forms of life.[11]

Part II. Material traces for transformation

However, when imagining the future we might want to go beyond ideas of ruin, pollution, and decline. What if we challenge our perception of waste as a by-product, thinking of it instead as a material entity to reshape our relationship with the environment? What happens if we shift our perception of waste and acknowledge its multiple temporalities not only as destruction, but also as helping to create heritage value? As Eriksen and Armiero put it, waste is the most visible outcome of globalisation, and if waste can't be erased, we need to learn how to 'stay with the trouble'[12] to build a more just and sustainable future.

This shows that my role as artist in search for spatial justice through urban regeneration might include challenging unjust geographies and exploring possibilities for developing innovative ways to reimagine these memory-traces into new materialisms that can transfer 'rubbish' to new categories of value, capable of telling stories of a new 'set of abandoned futures'.[13] As Beata Frydryczak points out, a new definition of ruins is needed, one that finds hope in the natural processes that ensure them a new status and a different ontological importance.[14] I link this suggestion to the category of 'waste value' (rubbish), in which Thompson highlights the importance of understanding the social and cultural dynamics of waste[15] to see the potential of 'ruin waste'[16] as a site of transformation to advance material and spatial reconstitution.

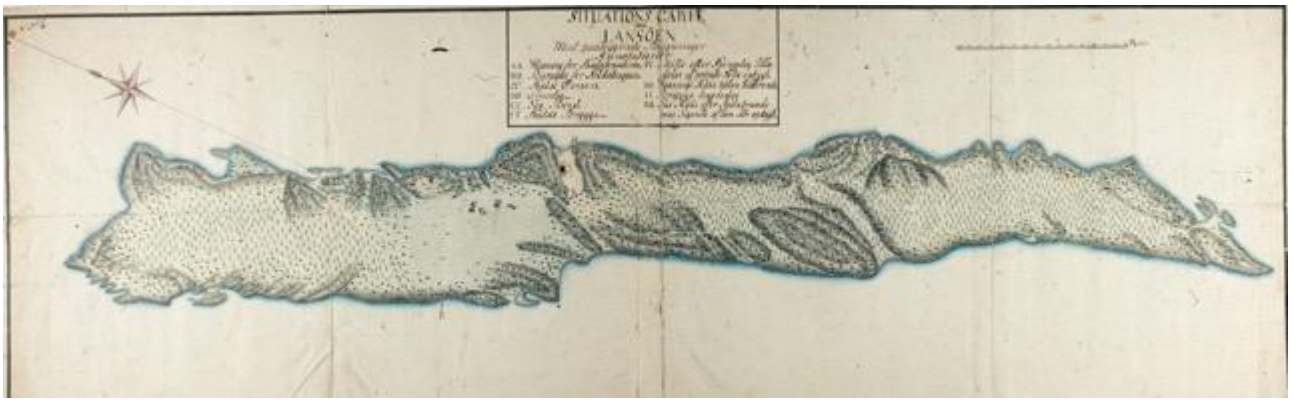

Figure 4.10. Old map of Langøya, a Norwegian island located in Holmestrandsfjord, south-west of Oslo. © NOAH.

Figure 4.11. Christiania Portland cement factory in Slemmestad, Røyken, Asker Municipality, Norway. © Slemmestad bibliotek/Cementmuseum/Geologisenter.

Figure 4.12. Railway on the east side of Langøya. Each carriage could take 7-8 tonnes of limestone. © Slemmestad bibliotek/Cementmuseum/Geologisenter.

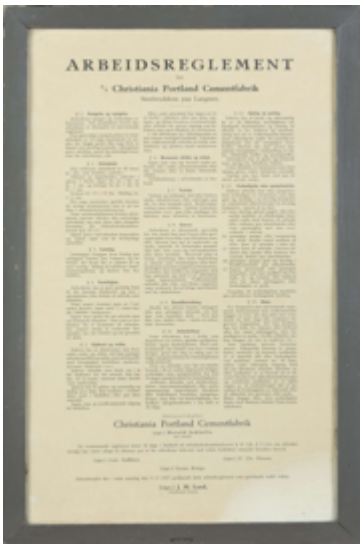

Figure 4.13. Work regulations in a black frame with glass signed by J. M. Lund, 1927. © Slemmestad bibliotek/ Cement Museum/ Geologisenter.
Figure 4.14. Aerial view of Langøya. https://cementmuseet.no/fabrikkhistorie/langoya/ (no date) © Slemmestad bibliotek/ Cement Museum/ Geologisenter.

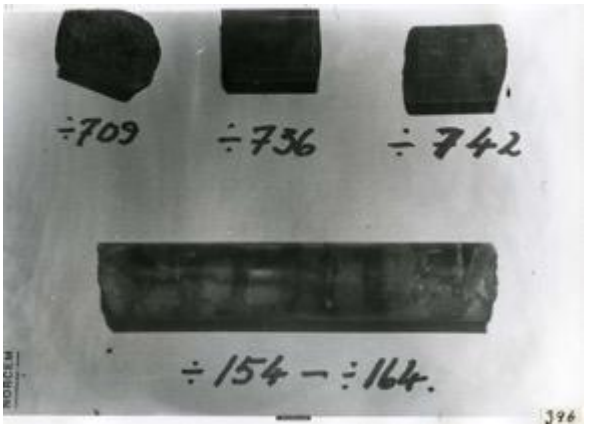

Figure 4.15. Drilling. The limestone quarry had several thin layers of clay which made extraction easier, 1930-40. Vestfold Fylkeskommune © Slemmestad bibliotek/ Cementmuseum/ Geologisenter.
Figure 4.16. Trial drilling for future mining on Langøya. In the tests (-154) to (-164) we see a layer of fossils. (undated).

Figure 4.17. Fossils from Langøya. (ref SCM 0627 10387) © Slemmestad bibliotek/ Cement Museum/ Geologisenter.
Figure 4.18. Image from the fjord side with fossils. (ref SCM 0627 10395) © Slemmestad bibliotek/ Cement Museum/ Geologisenter.

Figure 4.19. Inside Langøya, 1955. (ref _DSC6846) © Slemmestad bibliotek/ Cementmuseum/ Geologisenter
Figure 4.20. Langøya, 1970s. Repro: Morten Flaten, 2023 © Slemmestad bibliotek/ Cementmuseum/ Geologisenter (ref. _DSC0862)

Figure 4.21. and Figure 4.22. Aerial images of Langøya. The ruins of modernity[17] as a by-product of (injust) social-ecological relationships[18] which are often normalised through the neoliberal discourse that enables the exploitation of natural resources for capital growth. © NOAH.

Figure 4.23. and Figure 4.24. The topography of Langøya is irreversibly shaped by extraction and toxic waste dumping. © NOAH.

Figure 4.25. Transportation of mine tailings from Langøya to the new district in Lier Kaia, near my new studio. (undated) © Fjordbyen Lier and Drammen.

Figure 4.26. Aerial view of Fjordbyen Lier and Drammen. Currently a car park, this area will become a new district of Norway. © Fjordbyen Lier and Drammen.

ENDNOTES

1] Felix Guattari, *The Three Ecologies* (The Athlone Press, 2000), p. 27.
2] Thomas Hylland Eriksen and Elisabeth Schober, 'Waste and the Superfluous: an Introduction', *Social Anthropology/ Anthropologie Sociale* 25.3 (2017), pp. 282–287, doi: 10.1111/1469-8676.12422.
3] 'Langøya Nature Reserve' [Langøya naturreservat], in *Natur I Vestfold: Veiviser til naturverno radene og Faeder nasjonalpark* (Forlag og Fylkesmannen i Vestfold, 2013)
<https://www.statsforvalteren.no/siteassets/fm-vestfold-og-telemark/miljo-og-klima/verneomrader/dokumenter/vern

eomraader-vestfold/langoya-naturreservat/re-langoya-naturreservat-natur-i-vestfold-2014.pdf> [accessed: 12 August 2024].
4] A. Westvang, 'Langøya – øy i Holmestrand [Langøya: Island in Holmestrand'], *Store Norske Leksikon* [Great Norwegian Encyclopedia] (n.d.). https://snl.no/Lang%C3%B8ya_-_%C3%B8y_i_Holmestrand [accessed 05 August 2024].
5] 'Langøya', NOAH < https://www.noah.no/langoya/> [accessed 15 August 2024].
6] Liboiron, *Pollution is Colonialism.* This idea is addressed in Chapter 1, 'Land, Nature, Resource, Property', where Liboiron outlines 'the historical and conceptual foundations for the invention of modern environmental pollution as a colonial achievement'.
7] Armiero, *Wasteocene,* pp. 2, 9-10.
8] Alexander Dunlap, 'The Politics of Ecocide, Genocide and Megaprojects: Interrogating Natural Resource Extraction, Identity and the Normalization of Erasure', *Journal of Genocide Research,* 23. 2, (2021), pp.212–235 (p. 230), doi: 10.1080/14623528.2020.1754051.
9] Beata Frydryczak, 'Ruins: Between Past and Present, Between Culture and Nature', *Eidos: Journal for Philosophy of Culture,* 7.2*,* (2023), pp.9-16 (p. 14), doi: 10.14394/eidos.jpc.2023.0011.
10] Douglas, *Purity and Danger*, p. 44.
11] Reno, 'Toward a New Theory of Waste', p. 22.
12] Donna Haraway, *Staying with the Trouble: Making Kin in the Chthulucene* (Duke University Press, 2016).
13] O'Sullivan discusses Robert Smithson's notion of entropy as being the 'memory-traces of an abandoned set of future', Simon O'Sullivan, 'Fictioning the Landscape: Robert Smithson and Ruins in Reverse', *Take on India*, 2.3 (2017), pp. 61-63. <https://www.simonosullivan.net/articles/Robert_Smithson_and_Ruins_in_Reverse.pdf> [accessed 8 June 2025].
14] Frydryczak, , p. 14.
15] Thomas Hylland Eriksen, 'Waste is a Property of the Human Mind', Waste Society, <https://wastesociety.files.wordpress.com/2021/11/eriksen_waste-is-a-property-of-human-mind.pdf> [accessed 8 June 2025].
Eriksen suggests 'waste as a by-product of consumption and production' that is often hidden from view.
16] Tim Edensor, *Industrial Ruins: Space, Aesthetics and Materiality* (Berg Publishers, 2005).
17] Julia Hell and Andreas Schönle, Andreas *Ruins of Modernity* (Duke University Press, 2010).
18] Armiero, *Wasteocene.*
19] 'Siste lekter fra Langøya', Fjordbyen Lier Drammen, <https://fjordbyenlierdrammen.no/aktuelt-nyheter/siste-lekter-fra-langoya> [accessed 4 November 2024].

Chapter 5

Reimagining Public Art, Urban Space & Spatial Justice.

On the Politics of Waste Value.

> *Thinking spatially about justice not only enriches our theoretical understanding, it can uncover significant new insights that extend our practical knowledge into more effective actions to achieve greater justice and democracy.*
>
> — Edward J. Soja, 2008.[411]

Considering the overwhelming expansion of landfill sites and waste dumping across the globe, the growing global trade in waste and concerns about environmental depletion and climate change, the recategorisation of waste into a valuable resource is more urgent than ever, as it imbues waste with new value, meaning and function and contributes to an idea of progress that takes care of the planet, acknowledges all forms of life and contributes to spatial, social and environmental justice. In this chapter I focus on the practice of the case study 'Kverndalen in New Light', an urban regeneration project taking place in Skien, Norway, in which I undertake a historical and spatial analysis of the city and explore speculative thinking as a way of creating new possibilities, methods and processes for reinscribing waste with value.

These urban interventions seek to consider the materiality of waste as an 'emergent alternative'[412] to extractive exploitation, capable of challenging structures of power and social order to stimulate change and advance spatial justice in the city.[413] I address this in two ways, which inform the two sections of the chapter: Section One, 'Towards a Material and Spatial Reconstitution', presents the case study 'Kverndalen in New Light' (Kverndalen i nytt lys), an urban regeneration project in Skien, Norway, where I am developing two new public art works, *A Bigger Splash* and *Blue Bonds.* The case study focuses on methods, practices and possibilities of transforming waste and waste materials

[411] Edward W Soja, 'The City and Spatial Justice' ['La ville et la justice spatiale', translated by Sophie Didier, Frédéric Dufaux], conference paper: *Spatial Justice*, Nanterre, Paris, March 12-14, 2008, *Spatial Justice* 01, September 2009, <www.jssj.org/article/la-ville-et-la-justice-spatiale/?lang=en> [accessed 15 February 2023].
[412] Adrienne Maree Brown, *Emergent Strategy. Shaping Change, Changing Worlds* (AK Press, 2017), p. 5.
[413] Edward W. Soja, *Seeking Spatial Justice* (Minnesota University Press, 2010).

into inclusive alternatives for urban regeneration and development. When the project proposals were pre-approved within the municipality, we started to look for potential partnerships in the region that together could help us to find the technology and techniques that would allow us to transform construction waste and plastic waste harvested in the sea into new sculptures. While *A Bigger Splash* transforms waste and leftovers through hand-made and experimental processes, *Blue Bonds* employs a machine-made process utilised in mass production. Believing that scientific and artistic collaborations can lead to groundbreaking ideas and solutions, we initiated a collaboration with Norner, a global leading polymer research and development organisation based in Skien, and with Plastinor, a small local company that specialises in rotational moulding to allow us to use up to 90 per cent of discarded plastic into the new playscape. By exploring new methods of melting, reshaping and repurposing discarded plastic found in the Telemark canal and in the sea, I set out to develop new methods for art production that explores processes of reuse, recycling, upcycling or repurposing through already existing technologies that are already used for the recycling of by-products from other industries. Consequently, these urban interventions aim to mobilise material and spatial reconstitution.

Through a series of urban interventions I have turned to my practice to find new ways of departing from Michael Thompson´s notion of 'value as a mutable social relation' to explore ways to shift our perception of waste as valueless towards thinking of it as 'durable',[414] to acknowledge disposability as a heritage concept in urban planning by showing that the creation of sustainable cities involves racialised forms of social injustice and violence.[415] I demonstrate how the practice enabled me to observe that the experience of 'otherness' through waste and wasting practices also leaves traces in the urban space that accounts for the temporality of the city's archaeological layers, and therefore they must be acknowledged as a heritage value too. I suggested 'places of disposal' as a contribution to Guttormsen's heterotopic features to read deep time in the city.

Second, the term 'places of disposal' demonstrates the ways these temporary geographies that waste occupies in the city raise questions of agency, power, positionality, ethics and spatial justice. By exploring Guttormsen´s four concepts from his

[414] Michael Thompson, *Rubbish Theory. The Creation and Destruction of Value* (Pluto Press, 2017), p. 4. Thompson suggests that the three categories of value are *transient, rubbish* and *durable*.
[415] Ida Danewid, 'The Fire this Time: Grenfell, Racial Capitalism and the Urbanisation of Empire', *European Journal of International Relations*, 26.1, pp. 289–313, doi: 10.1177/1354066119858388.

archaeological-theoretical conceptual tool box (dissolution, collage, palimpsest and stratigraphy) to enable the temporalities of the city in urban planning projects, I argue that the notion of places of disposal unveils the colonial legacies in the city's deep time through the lens of wasting practices.[416] I demonstrate that by acknowledging places of disposal as a heterotopic feature with heritage value, we raise awareness about the creation and maintenance of unfair geographies that otherwise remain (in)visible and unchallenged. I conclude by reflecting briefly on the interdisciplinary methodology that enabled me to deal with the complexity of waste and its temporal mnemonic qualities to reorientate it from negative to positive (from ruined, discarded, disposed of, marginal to 'waste as things',[417] a valuable resource) to demonstrate how the development of Smithson's idea of entropy[418] led me to address entropy not as a measure of disorder, but rather as a dynamic and creative force that generates new forms and possibilities.

I. Towards a Material and Spatial Reconstitution

Case Study: Kverndalen in New Light (*Kverndalen i nytt lys*), Skien, Norway, 2020-2026

'Kverndalen in New Light - The Blue Bond' is an art and urban development project for the new district of Kverndalen in Skien, Norway, led by Tom-Eirik Lønnerød from Skien municipality in collaboration with me, the artist Stine Gonsholt (NO), the curator and producer Kristine Wessel/ Mesén and several local stakeholders. The project is supported by KORO (Public Art Norway), Sparebankstiftelsen Grenland, Vestfold og Telemark Fylkeskommune, and Skien municipality.[419] This case study functions as a prototype, or pilot project, in an urban setting in which I combine a historical and spatial analysis with practice research to explore ways to perceive and explore 'waste as thing' (as a resource) capable of moving from being valueless to being inclusively 'durable', with cultural potential. The case study enables me to understand in depth the complexity of waste's transformative potential, to reconsider research approaches and methods and the potential impact of my PhD research in real-life contexts.

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[416] Marco Armiero, *Wasteocene. Stories of the Global Dump.* Elements in Environmental Humanities, (Cambridge University Press, 2021).
[417] Gay Hawkins, *The Ethics of Waste. How we Relate to Rubbish* (Rowman & Littlefield, 2006), p. 73.
[418] Robert Smithson, 'Entropy and the New Monuments', *Artforum,* June 1966, <https://holtsmithsonfoundation.org/entropy-and-new-monuments >
[419] *A Bigger Splash*, Marisa Ferreira, <https://marisa-ferreira.com/A-Bigger-Splash-2020-24> [accessed 10 April 2023].

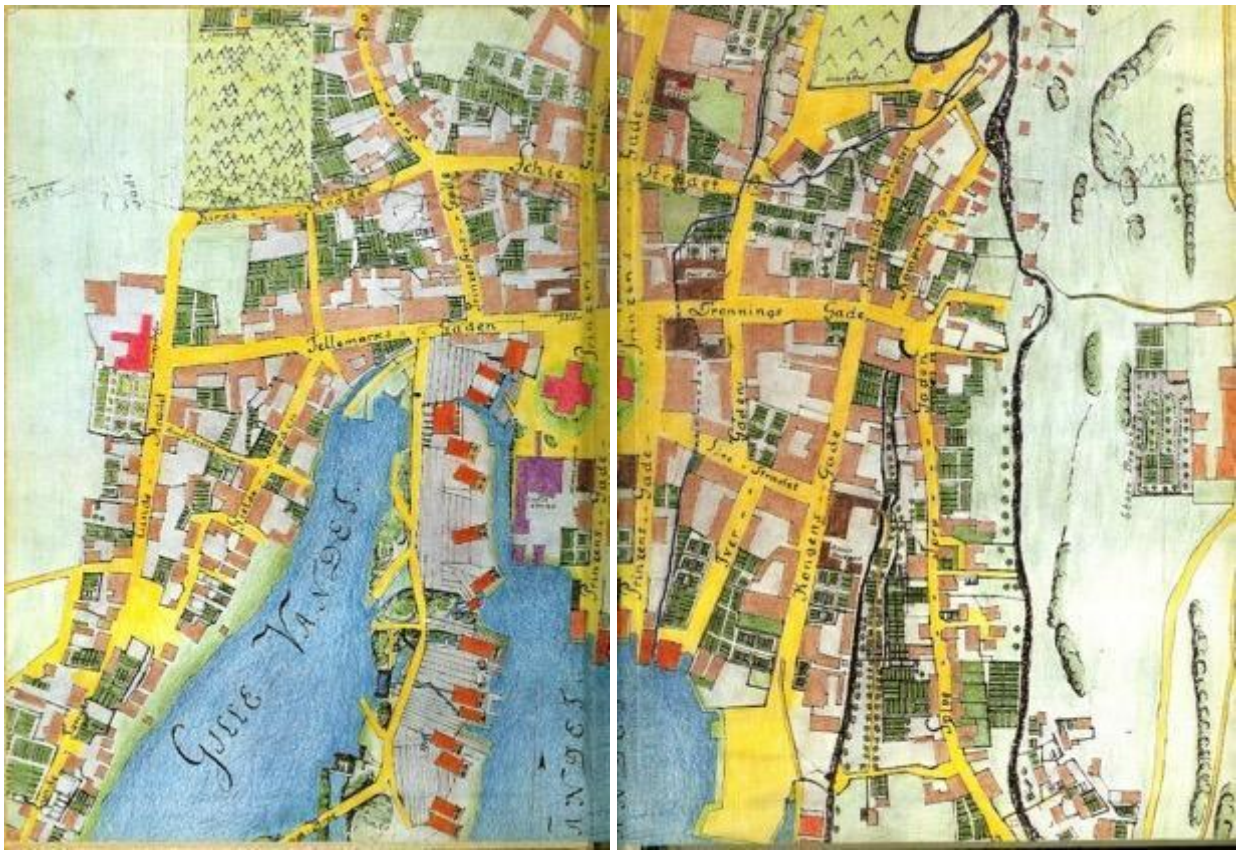

Figure 5.1. Map of Skien from the archaeologist Siri Myrvold's book *Jakten på det eldste Skien* (The hunt for the oldest Skien), 1996, about the archaeological investigations/ excavation she led in Skien's city centre.[420]

The Norwegian city of Skien is the capital of the Vestfold and Telemark region, with about 55,000 inhabitants, forming, together with Porsgrunn and Bamble, the Grenland region. Skien is the largest municipality of the Gea Norvegica UNESCO Global Geopark,[421] well known for its geological diversity, and it is the oldest portion of Southern Norway's geology, west and northwest of the city centre.[422] Founded around 1000, Skien is one of Norway's oldest cities and the only Norwegian medieval town not founded by a king.[423] The city has been a marketplace since the Viking age, and was considered one of the most important commercial and cultural centres in the sixteenth century, a position it retained until the

[420] Excavations led by Siri Myrvold have found archaeological traces under the northern part of the arcade and on the market square, which confirms that the site has hosted commercial and social activities for a thousand years.
For additional information see: *Skiensatlas*, <www.skiensatlas.org/soner/sentrum/handelstorget>
available at: <www.nb.no/items/URN:NBN:no-nb_digibok_2014072406011>
Images retrieved from *Skiensatlas*:
<skiensatlas.org/content/advancedsearch?SearchText=sentrum&SearchContentClassID=27>
[accessed 12 April 2023].
[421] Gea Norvegica Geopark is the first European Geopark in Scandinavia. It is located in south-eastern Norway, in the counties of Vestfold and Telemark, bounded by the administrative areas of the Kragerø, Bamble, Porsgrunn, Skien, Nome, Siljan and Larvik municipalities. Geoparken, <www.geoparken.com> [accessed 12 April 2023].
[422] Geoparken, <https://www.geoparken.no/> [accessed 12 April 2023].
[423] Skien Kommune, <https://www.skien.kommune.no/media/ffbphadj/in-love-with-skien_web.pdf> [accessed 12 April 2023].

early 1800s. However, Skien's commercial position fluctuated as a result of conflict and economic conditions in Europe; while the battles of the eighteenth century increased demand for Norwegian lumber, the early nineteenth century saw a crisis and recession brought on by the Napoleonic Wars.

Figure 5.2. Map of Skien. Watercolour showing the city and surrounding villages, with handwritten names in ink, approx. 1790, 54x43cm © Telemark Museum - ID TGM-BM.1935-36:061[424]

Skien has been devastated by several city fires over the centuries, the most recent dating from 1886, when almost the entire city centre was destroyed, with exception for the buildings of the Norges Bank, Prestegården and Cappelens villa at Lundetoppen. The city plan designed after the 1886 fire marks an important moment for Skien's urban development, as the new plan broke radically with the old street network by introducing several of the requirements for a modern city centre built on a central axis, with symmetry and structure, open spaces and squares. The city council also specified that brick

[424] Digital Museum Norway https://digitaltmuseum.no/011025272817/kart [accessed 12 April 2023]. The map of Skien is also available in Thor Inge Rødseth and Tor Ketil Gardåsen, *Med gamle kart gjennom Skiens historie* [Skien's History Through Old Maps], 1984. For more details see Skiensatlas, skiensatlas.org/content/advancedsearch?SearchText=sentrum&SearchContentClassID=27 and www.skiensatlas.org/litteratur/geografi/med-gamle-kart-gjennom-skiens-historie [accessed 12 April 2023].

construction should be used for buildings in the centre,[425] and placed a straight line from the church to the sea. The city's transformation from a timber-producing town to a paper centre of paper production in the latter part of the nineteenth century was thus defined by industrialisation and population growth that led to an increased demand for housing; this was mainly built of wood, and was concentrated and located close to the industries by the water. Union Bruk (Union Co.) was established by Norwegian-British engineer Benjamin Sewell and Norwegian Emil Heyerdahl in 1873 and was soon followed by Skotfoss Bruk and the Skien cellulose factory. The construction of the Telemark canal[426] led by Norwegian engineer Gunnar Sætren was completed in 1892 to connect Skien to Dalen, from the east to the west of Norway. The canal was important for the lumber trade and the transport of people and goods. The first years of the 1900s were marked by new economic advances and new construction techniques. The buildings were characterised by concrete, wood and steel facades.[427] With the German invasion on 9 April 1940, the German army seized control of the cities and political posts; the national economy and urbanisation were neglected in favour of war interests.

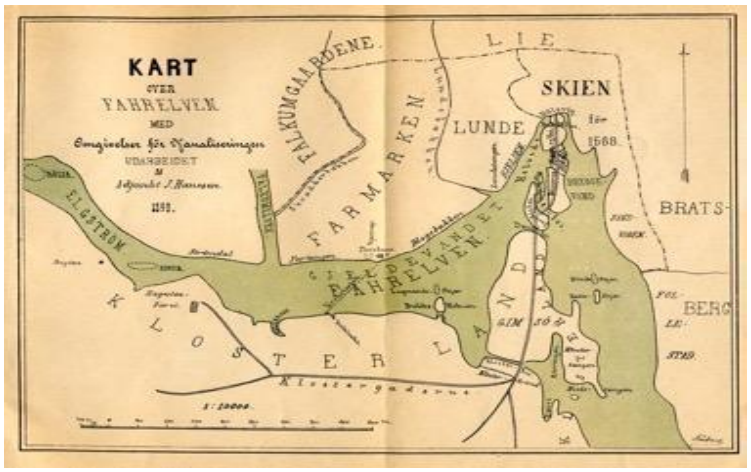

Figure 5.3 (left). Map of the four waterfalls that flowed in or near the centre of Skien, 1898. They provided power for mills and sawmills.[428] © Skienvassdraget. Figure 5.4. (right) Map of Skien, lithograph, 1900.[429] After the fire in the city in 1886, a *murtvang* (brick construction method) was implemented: this can be seen on the map in red.

[425] More on the city fire from 1886 and the introduction of '*murtvang*' (brick construction) in: 'Skiens byplan og murbebyggelse etter bybrannen i 1886' , Wikipedia, <no.wikipedia.org/wiki/Skiens_byplan_og_murbebyggelse_etter_bybrannen_i_1886> [accessed 12 April 2023].

[426] Skien is Norway's only city with canals, and one of only four cities in Scandinavia with canal locks in the city centre.

[427] Asplan Viak, Kulturhistorisk stedsanalyse [Cultural-historical analysis], Skien Municipality, 2022, p. 20. <www.skien.kommune.no/media/tqbfksom/kulturhistorisk-stedsanalyse-skien-sentrum.pdf> [accessed 12 April 2023].

[428] 'Fire Fosser', Telemarkskanalen <skiensvassdraget.no/lokasjoner/fire-fosser/> [accessed 12 April 2023]

[429] 'Kart over Skien [map of Skien]', Kartverket <www.kartverket.no/om-kartverket/historie/historiske-kart/soketreff/mitt-kart?mapId=6645> [accessed 12 April 2023].

Figure 5.5 (left) Skien after the city fire in 1886. [430] Figure 5.6. (right) Skotfos Papirfabrikk (paper factory), Norge Solum © Telemark Museum - ID TGM-B.19813[431]

Figure 5.7. Bandakkanalen/ Telemarks canal, 1992 © Arkivet - ID RA/PA-1522/U/Ua/L0012a.[432] The image shows the locks at Vrangfoss, the canal's largest lock system.

[430] Skiensatlas, < skiensatlas.org/content/advancedsearch?SearchText=sentrum&SearchContentClassID=27> [accessed 12 April 2023].
[431] 'Skotfoss Bruk', Digital Museum Norway < digitaltmuseum.no/011015346971/skotfoss-bruk> [accessed 12 April 2023].
[432] 'Bandakkanalen, Telemarkskanale', Digitalsarkivet, <foto.digitalarkivet.no/fotoweb/archives/5001-Historiske-foto/Indekserte%20bilder/PA1522Ua12_006.tif.info> [accessed 12 April 2023].

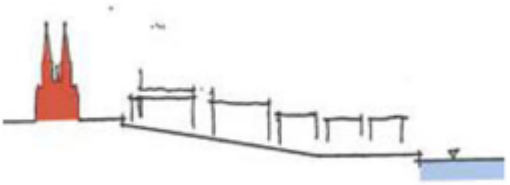

Figure 5.8. The position of the church in relation to the water and the city buildings. Building development in the city since the 1886 plan has a limited number of storeys, to retain the church's dominant position.[433] © Ramboll/ Spir Plan Arkitektur, 2008.

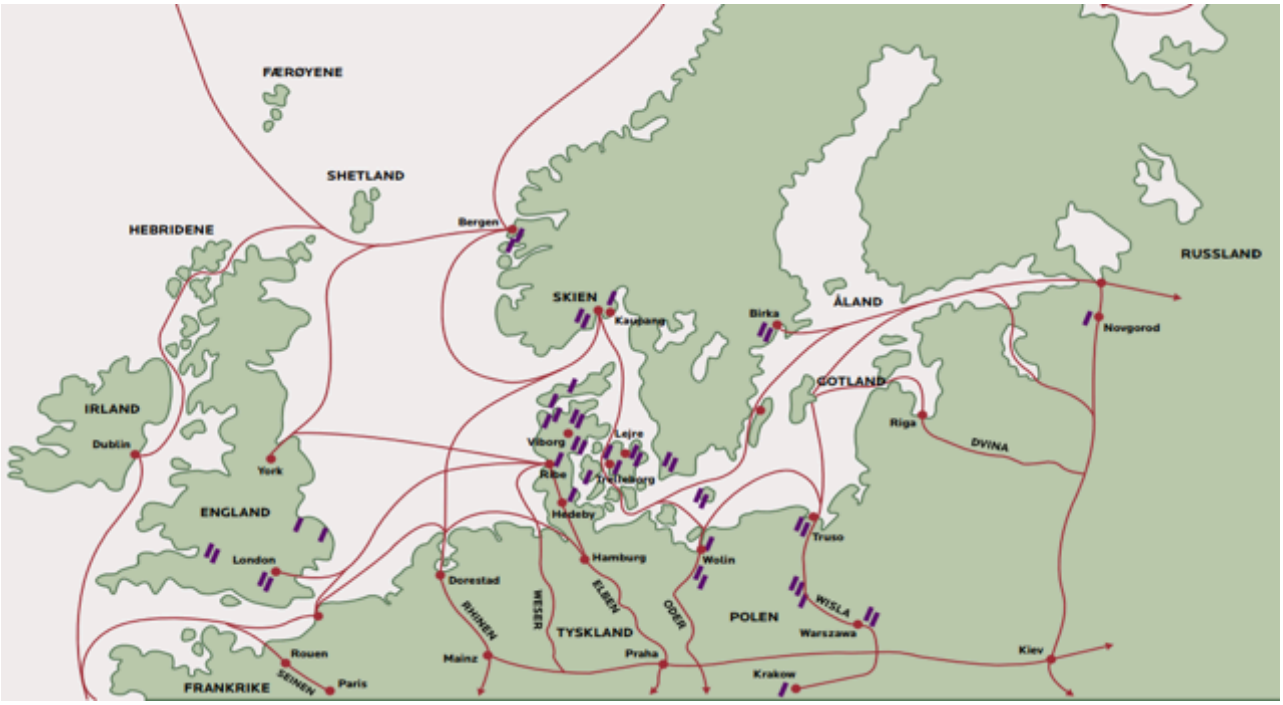

Figure 5.9. European map of trade routes in the Viking period and the Middle Ages © Skien Kommune/ Asplan Viak, 2022, p. 10.[434] The places marked with a purple rectangle show finds of whetstone from Eidsborg, Norway.

After World War Two, the liberalisation of car sales contributed to the development of larger roads, and with the discovery of Ekofisk in 1969, marking the beginning of the Norwegian oil adventure,[435] by the 1970s the centre of Skien had expanded north via Kverndalen, resulting in a large housing development that transformed Skien into a modern city, with substantial contemporary brick apartment blocks with open green spaces and a lower concentration of housing. In the 1980s, the heart of the historic, industrial and administrative city had a wide variety of shops, and the streets were bustling with activity. Processes of deindustrialisation marked the city's transformation in the following decades, marking a shift from the heavy industry of the past (mining, ironworks, sawmills, and

[433] Ramboll & Spir Plan Arkitektur. (2008) 'Skien sentrumanalyse [Skien report]', (Skien Municipality, 2008), p. 14. <www.skien.kommune.no/media/ftgkptcq/sentrumsanalyse-min.pdf> [accessed 12 April 2023].
[434] Asplan Viak, 'Kulturhistorisk stedsanalyse' (Cultural-historical city analysis), (Skien Municipality, 2022), p. 10. <www.skien.kommune.no/media/tqbfksom/kulturhistorisk-stedsanalyse-skien-sentrum.pdf>, [accessed 12 April 2023].
[435] 'Norwegian Oil History in 5 minutes', Norwegian Government Ministry of Petroleum and Energy, 2021, <https://www.regjeringen.no/en/topics/energy/oil-and-gas/norways-oil-history-in-5-minutes/id440538/> [accessed 12 April 2023].

timber) to more dynamic and innovative businesses and R&D institutions, mostly within the engineering, manufacturing and technological industries.[436] Since 2011, the population of the city centre has grown, allowing for the continuation of large-scale housing development in places like Skien Brygge, Klosterøya West and Prestejordet; however, some areas of the city centre, including the Kverndalen area, where my project takes place, are still facing difficulties – including unoccupied buildings and empty commercial premises, poorly maintained buildings with insufficient lighting, and a lack of urban vitality (because social life takes place indoors); the outdoor areas are dominated by private car parks. Nevertheless, several of these areas of the city have been transformed into more vibrant, inclusive, and well-defined spaces, thanks to a number of urban projects implemented in recent years by Skien municipality, which has contributed to the city's recognition with the Attractive City award in 2021.[437]

'Kverndalen in New Light'. Urban regeneration project, 2020 onwards

It is in this context that the urban transformation of Kverndalen is taking place. The ambitious urban development project 'Kverndalen in New Light' (*Kverndalen i nytt lys*) is defined by three different phases over the next few years. The municipality is building a new urban home for the elderly, upgrading the public areas in Kverndalen; Bratsberg Group and its partners are constructing a large housing project east of Lietorvet and a pedestrian and cycle connection between Skien train station and the city centre, which is also designed to go through Kverndalen. I arrived on the project in 2020 after being invited to submit a proposal[438] for the public art projects to be created at the new home for the elderly (Kverndalen Bo-og Dag Senter). The jury decided not to commission me for that specific project as they wanted my proposal to be realised in the planned pedestrian areas in Kverndalen. The curatorial team organised an introductory seminar in January 2020 for

[436] Nordic Safe Cities, <nordicsafecities.org/member-cities/skien-no/> [accessed 12 April 2023].
[437] The award recognises and honours creative policies, plans, and cooperative initiatives that improve living conditions in urban areas, the environment, and human health. It also encourages efficient land use, eco-friendly transportation, and a reduction in energy consumption. The award will help to highlight successful and motivational role models.
See here for information on the award the Norwegian government gives to small cities to celebrate their achievements: 'Attractive City: State Award for Sustainable Urban and Regional Development', Norwegian Government,
<www.regjeringen.no/no/tema/kommuner-og-regioner/by_stedsutvikling/attraktiv_by_pris/id2895050>
[accessed 12 April 2023]
[438] In 1998, Norway introduced a scheme that automatically sets aside a percentage (0,5-1,5%) of the construction budget of new state-owned buildings in the whole country for the implementation of art projects. These projects are managed through KORO [Public Art Norway], <koro.no/english/> [accessed 14 April 2023].

the three artists involved in the proposal submission. We were introduced to the urban plan for Kverndalen through its long history that connected the city to the sea. I was fascinated by the multiple maps and stories of the transformation of Skien, such as how the proximity to the sea had enabled the city to become one of the most important commercial ports of the country, which then sparked the establishment of heavy industry that gradually put the city on the international map. During the seminar we were also introduced to the main socio-economic challenges Kverndalen faces today, evidenced by the many empty premises and lack of social life in its urban spaces, so the proposals were intended also to contribute in some way to making the outdoor area of the new home for the elderly an open and lively space for the city's inhabitants. To better grasp the municipality's vision and goals, it was vital to be aware of these underlying assumptions and the potential contribution that a public art project might provide to the community, but I made the decision to focus on how public art can address, promote awareness of the unfair social, economic, and environmental concerns we currently face, and encourage behaviour change in relation to these, as well as considering how it can improve the well-being of future generations.[439]

During my initial research for the proposal, just before the outbreak of COVID-19, I became aware that Kverndalen not only served as the northern road to the town centre, but also that Kverndalsbekken, also known as 'Lortebekk' (shit brook), was used as a route to Bryggevannet to carry rubbish and debris.[440] This process happened while I was developing my project 'Lost Futures' for the Paris Art Fair, which was entirely built from discarded glass, with a stainless steel structure, to invoke utopian modernist architectural ideals through its fictional entropy, and my initial material experiments in my MRes at the Royal College of Art, through the collection of material objects in ruins in abandoned buildings across London. I felt naturally drawn to the idea of exploring waste further as raw material to produce an art proposal for a city whose transformation and changes have been motivated by processes of industrialisation, urbanisation, and globalisation.

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[439] The report *Our Common Future* put forth the very general notion that sustainable development consists of economic development activity that 'meets the needs of the present without compromising the ability of future generations to meet their needs'. The report, that became known as Brundtland Commission (Gru Harlem Brundtland is the former Norwegian prime minister) also defines the three overlapping elements of sustainability: Environment, Economy and Equity.
World Commission on Environment and Development, *Our Common Future* (United Nations, 1986), p. 39. <sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf> [accessed 23 April 2023].
[440] Kverndalen, Skien Municipality, <www.skien.kommune.no/by-og-naeringsutvikling/byutvikling/prosjekter-i-skien-sentrum/kverndalen/> [accessed 23 April 2023].

Influenced heavily by the city's rich geological past and the introduction of brick construction in the city's architecture in the aftermath of Skien's last major fire in 1886, I started to look at the ways water can shape the Earth's crust and how the fire transformed the city's urban landscape towards what we know today; but more importantly, I identified how that change was made possible by digging into the city's industrial history. I found out that Bratsberg Teglverk (brickworks) was established by Christian Blom in 1895 as a response to the demand for brick construction after its compulsory introduction after the 1886 fire. The company was located in Skien until 1947, when it moved to Lunde, where in 2014 it finally closed down.[441] The end of Bratsberg Teglverk also marks the end of brick production in Norway. These findings resulted in the decision to reuse the leftover materials from Bratsberg Teglverk to make a new pavement that would be part of the landscape, together with a group of five sculptures in stainless steel that represent the splashing movement of water when it touches the Earth's surface.

Figure 5.10 and Figure 5.11. Initial proposal for *A Bigger Splash*, 2020. © Marisa Ferreira/ BONO.

At the end of the competition, I realised that this approach was no longer possible, as the material objects from Bratsberg Teglverk had all been removed from the site by Wienerberger. When we began to consider other alternatives, we learned that the city had a large open-air stone storage (*steinlager*) facility which contained stones discarded from other projects in the city. The global pandemic, the strict rules for travelling to Norway and my own health issues at the time delayed the project for several months; however, in the

[441] See: Bratsberg Teglverk, Skien, <https://www.teglverk.no/teglverk/121-bratsberg-teglverk-skien> and 'Bratsberg Tegl', Industri Museum Norway, <http://industrimuseum.no/bedrifter/bratsberg_tegl> [accessed 12 February 2020; 10 April 2023].

autumn of 2021 I was able to visit the storage facility, together with the artist Stine Gonsholt, the curator Kristine Wessel, and the project manager Tom-Eirik Lønnerød, from the Skien municipality.

Journey to Voldsvegen, Skien, Norway

Fragmented notes, Autumn 2021.

> *Blue sky, mild temperature, birds are singing. We left for our first site visit to the open-air stone storage located beside Skien Airport. After passing a large gate and parking the car, we were warmly welcomed by Henning Thorsen from the municipality, who gave us permission to start to explore. I was interested in looking at this '*Wastescape*' as a form of entropy that, as well as offering value, could move from entropy-irreversible, no entropy, reversible-new entropy.*
>
> *Walking in the stone storage facility was an experience of otherness, where the expenditure, excess and waste marked a strong feeling of being confronted with the consequences of thinking about urban transformation based on a throw-away approach to production. The space is well organised and with a clear structure that categorises the discarded stones in multiple piles, pallets, bags or boxes according to the size, format, colour, and texture of the stones. Looking closely, we can observe that more than two-thirds of the stones are imported from China, Germany, and Italy, as dozens, if not hundreds, of unopened packages placed on top of each other still have their import labels. I found myself trying to piece together a narrative of distant geographies layered in Skien's 'temporary' landscape in a tangible connection between memory, space, and temporality… a fascinating place, rooted in the city's past, its present time of disposal and its future prospects mixed in the collected and archived traces (stones sorted and catalogued in boxes according to type, format and colour), a kind of displaced and expanded entropy. These are material ecologies (or 'disturbed ecologies')[442] of destruction and displacement, of globalisation and disposal, of construction and urbanisation that change, and are changed by, non-human entities. This encounter with familiar stones, as well as their unfamiliar disposal or exotic*

[442] Darcy White, Julia Peck and Cris Goldie, *Disturbed Ecologies: Photography, Geopolitics, and the Northern Landscape in the Era of Environmental Crisis* (Transcript Verlag, 2023).

appearance, takes my experience at the stone storage facility into the archaeological imagination, where I try to emphasise the process of working with traces and remains, the discarded and left-over, in crafting present-past-future stories that together function as a core to the city's identity.

…

*We changed our perspective, took additional photographs, and moved towards a pile of stones at a normal pace. From this panoptic view, we could see the extension of the area, and the thousands of stones deposited here as if they were forming a new topography for this peripheral area of Skien. I cannot recall any other time when I have had access to so much material to choose from and work with. So we started to sort, choose, photograph, and collect different stones, ranging from dark to light and grey to identify the four types of stones to use in the pavement of '*A Bigger Splash*'. These all came from China and were cut into smaller formats of approximately 10x10x10cm and shipped to Skien.*

…

Departing from the idea that creative practice is at the heart of archaeological imagination,[443] *as suggested by Michael Shanks, how can sections of the archaeological imagination influence how materiality – site, practice and thing – is documented? How can the interwoven network of stories between the non-human, human and the archaeological landscape itself be translated? How can materials provide solutions to social, environmental, economic and political problems in the time of the Anthropocene? Then, how to transform or translate these material ecologies into another material capable of addressing the relation between waste, entropy, city and justice? What challenges the process of a linear entropy: can entropy be circular? Shifting from entropy to new materials, does this mean we move from entropy, zero entropy, to a new entropy? How does this new entropy differ from Smithson's notion of entropy?*

[443] 'Notions of the archaeological, sociological, and geographical imagination all imply creative understanding of life today, of possibilities of change, innovation, of the roles of individual perception, practice and agency'. Michael Shanks, *The Archaeological Imagination* (Left Coast Press/ Routledge, 2012), p. 18. The 'archaeological imagination' is also central to the scholar Dragoş Gheorghiu. For further reading on his term 'art-chaeology' to emphasise 'cognitive analogies between the archaeological research and the artistic practices', see Dragos Gheorghiu, *Art in the Archaeological Imagination* (Oxbow Books, 2020), p. 95.

Figure 5.12. Stone storage facility, with myself and the artist Stine Gonsholt selecting and sorting the stones; material experiments; prototype, autumn 2022. © Kristine Wessel, Marisa Ferreira/BONO.

The experiments with materials that I developed after the site visit, mixing construction waste (discarded concrete, ceramics, glass powder, and wood and metal dust) with a water-based solvent cast into silicone moulds taken from natural stones of the same size (10x10x10cm), helped me to understand that my emotional, physical, phenomenological and material engagement with the archaeological landscape (the stone storage facility) helped me to render the past, present and future by turning the discarded materials into things that are 'durable'.[444] I believe that in the global transition towards sustainability, artists cannot remain behind; only by questioning the world around us, by observing and analysing how we live today, can we reimagine a more sustainable future. My aim is to actively rethink the future by encouraging a multidisciplinary approach to the city and highlight that the transformation of Kverndalen needs to link art and artistic processes more strongly to urban and local development. It should include the creation of artworks that engage, challenge and open up space for discussion about the ecological crisis and its impact on the environment and affected communities (local or in distant geographies) through the materiality of *waste* as a way to think about the relationship between entropy, space, memory, and justice.[445]

[444] 'Durable' refers to one of the three categories of value, alongside 'transient' and 'rubbish'described by Michael Thompson in Thompson, *Rubbish Theory,* p.4.

[445] This does not mean that the whole project must be made from waste materials, but rather that being conscious about the choices we make is important. Small steps can make big changes in the ways we rethink our relationship to materials and the environment. The stainless steel sculpture, for example, is not made from found materials in the city, but stainless steel is a hundred per cent recyclable and originally made from discarded materials, so besides being a durable and maintenance-free material (especially important as Skien is near the sea), the sculpture can be recycled again in the future.

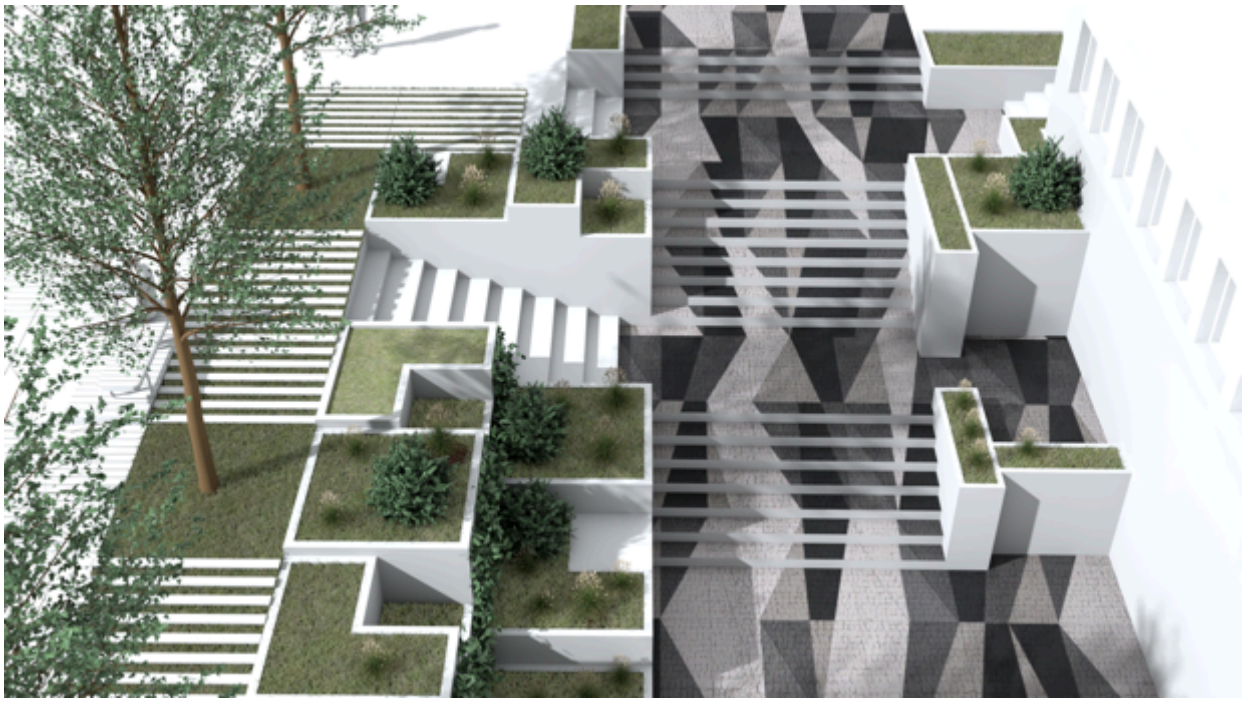

Figure 5.13. *A Bigger Splash'* sketch, 2022. © Marisa Ferreira/ BONO, Skien Kommune.

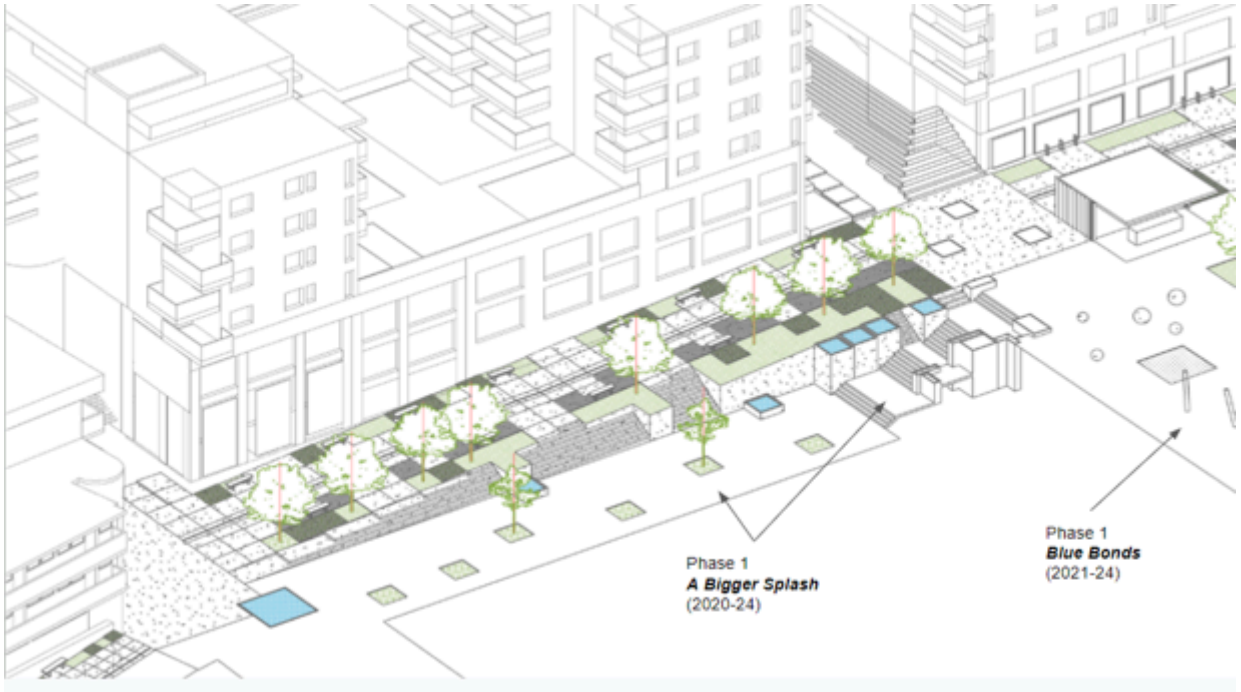

Image 5.14. Map of the location of the artworks *A Bigger Splash* and *Blue Bonds*, Skien, 2022. © Marisa Ferreira/ Skien Kommune.

Blue Bonds, 2021-

The planetary, marine waste, UN agenda, R&D collaboration, manufacture and tech.

During this process of rethinking the material potential of waste as a valuable resource for art production in the urban transformation of Skien, I was invited to join another project being developed in an area near *A Bigger Splash,* where new apartment buildings are

being constructed. The project includes the design of a 'playscape'[446] area for Kverndalen that will explore the same values and conceptual background of *A Bigger Splash.* Playscape, in this context, refers to a space in the city that promotes physical and emotional contact and enjoyment for people of all ages. It is neither a playground nor a specially designed area where kids can play. After some initial meetings with different departments in the municipality I understood that the municipality, as well as several other municipalities in the country, often buy prefabricated elements to create these urban playscapes. I was not interested in that, and neither could I see how I could contribute if the project's aim was to arrange a number of prefabricated elements in space; so instead I asked for the opportunity to rethink, reimagine, reinvent, repurpose what a playscape might be in an era of climate change.

In order to learn more about what a playscape means to the pupils at the local school – Lunde School – and how they envisioned a playscape that they would like to explore, I first created a questionnaire in collaboration with the curator, Kristine Wessel, and the project manager, Tom-Eirik Lønnerød. The results provided us with crucial information regarding the specific facilities and infrastructure that the students felt were necessary to have in the area, in addition to the physical structures they can climb, jump, or balance on. These included a bike park, rubbish bins, shade, and sitting areas. They also suggested providing a small space on site to sell ice cream and expressed a preference for a vibrant or striking colour over the construction of a themed area. Another aspect of the initial process that was valuable to the design of the area was the possibility of thinking of the space and landscape architecture as a whole. I had meetings with the team of landscape architects to understand their overall concept for the Kverndalen area and to enable me to become involved in the process of defining the landscape for the playscape. Learning the language of landscape architecture to explore methods and approaches to spatial analysis and intervention that were different from those I normally use has been a very interesting and rich experience for me as someone outside the field of architecture. The process can also be frustrating, because in large urban regeneration projects many social, economic and political interests are at stake; these often cause significant delays and hamper the progress of the project.

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[446] According to the Norwegian government's action plan for 2020 to 2029, there should not be more than 200 metres between homes and smaller green spaces and 500 metres between bigger green spaces in order for these spaces to serve as recreational spaces in everyday life. in The Norwegian Government's Action Plan is entitled 'Together for active lives' [*Sammen om aktive liv - Handlingsplan for fysisk aktivitet* 2020–2029], Chapter 3, p. 26.
<www.regjeringen.no/contentassets/43934b653c924ed7816fa16cd1e8e523/handlingsplan-for-fysisk-aktivitet-2020.pdf>

The initial proposal

Invented in the nineteenth century and massively developed in the twentieth century, thanks to the new extractive technologies developed in the oil industry, plastic has been researched and applied into a wide range of by-products and developed in a range of different industries, thanks to its characteristics of fluidity, malleability, durability, and versatility.[447] Modern society's linear thinking approach towards plastics, specifically after World War Two, has resulted in the environmental consequences of plastic use that we now face. Drawing from Skien's historical past as one of the most important commercial ports in the country, due its geographical location, as already discussed earlier in this chapter, and triggered by Kverndalsbekken being used to transport trash and debris to the sea, also remembering Norway's important role in the development of oil extracting techniques, which sparked the plastic industry revolution in the twentieth century, I was interested in reflecting on the ways that plastic waste impacts marine biodiversity and coastal communities and threatens human and non-human health and safety, and considering the global trade of goods, to raise awareness of plastic's environmental effects. The project's central idea is to create a playscape using plastic waste harvested in the sea as a way of addressing Kverndalen's transformation as an attempt at material reconstitution.

I understand the connection between the development of extractive techniques in the oil industry and the desire to make use of waste material from processing crude oil and natural gas with the revolution in plastic production[448] and the drilling technology that enables new techniques to survey and extract lithium in the Portuguese region of Barroso. I thus suggest that the methods, technologies and knowledge currently in use to make plastic from the waste material in the oil and gas industry could be used to create solutions to melting, reshaping and repurposing plastic waste. By transforming plastic waste into a valuable new raw material we can reduce the quantity of plastic waste that is incinerated, dumped and sent to landfill sites across the globe, because, as the OECD's 2019 report

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[447] Richard C. Thompson and others, 'Our Plastic Age', *Philosophical Transations of the Royal Society B: Biological Sciences*, 364.1973–1976 (2009), doi: 10.1098/rstb.2009.0054.
The study of environmental consequences of plastic use was a topic in the journal *Philosophical Transactions: Biological Sciences* published in 2009. In the introduction, titled 'Our Plastic Age', Richard C. Thompson and others introduce the theme by analysing plastic's strengths: fluidity, malleability, durability, producing a variety of by-products, and versatility, as well as its destructive weaknesses: longevity, leaching chemicals, and its significant impact on marine ecosystems.

[448] 'The Age of Plastic: from Parkesine to Pollution', Science Museum, 2019. <https://www.sciencemuseum.org.uk/objects-and-stories/chemistry/age-plastic-parkesine-pollution> [accessed 10 December 2022].

Global Plastics Outlook[449] indicates, only 9 per cent of plastic waste produced worldwide is actually recycled, and mismanaged waste accounts for 82 per cent of the plastic leaked into the environment.

Figure 5.15 and Figure 5.16. OECD Report: *Global Plastics Outlook. Economic Drivers, Environmental Impacts and Policy Options.* 22 February 2022.[450]

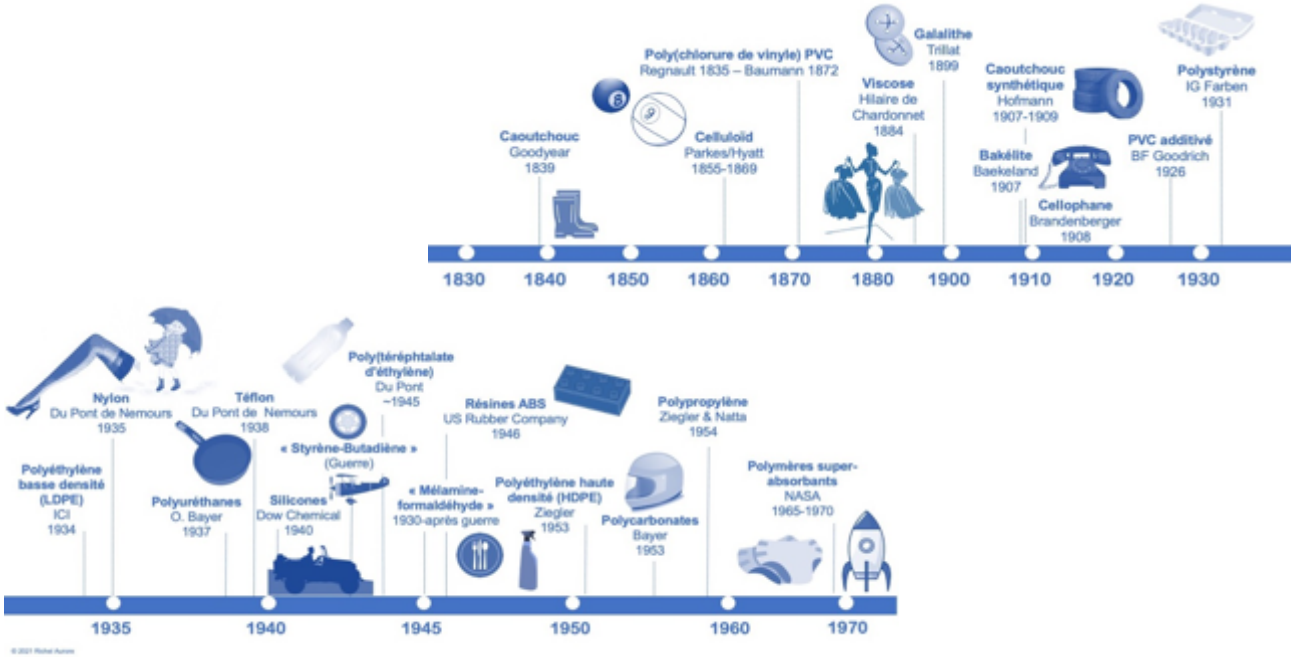

Figure 5.17. The plastics and bioplastics history © Aurore Richel.[451]

[449] OECD, *Global Plastics Outlook. Economic Drivers, Environmental Impacts and Policy Options.* (February 22nd 2022). pp. 20-21, doi: 10.1787/de747aef-en. <https://www.oecd-ilibrary.org/environment/data/global-plastic-outlook_c0821f81-en >

[450] Ibid.

[451] 'Plastics and Bioplastics: a 200 Year History of Research and Development', Chem4us, <www.chem4us.be/plastics-and-bioplastics-a-200-year-history-of-research-and-development> [accessed 8 June 2025].

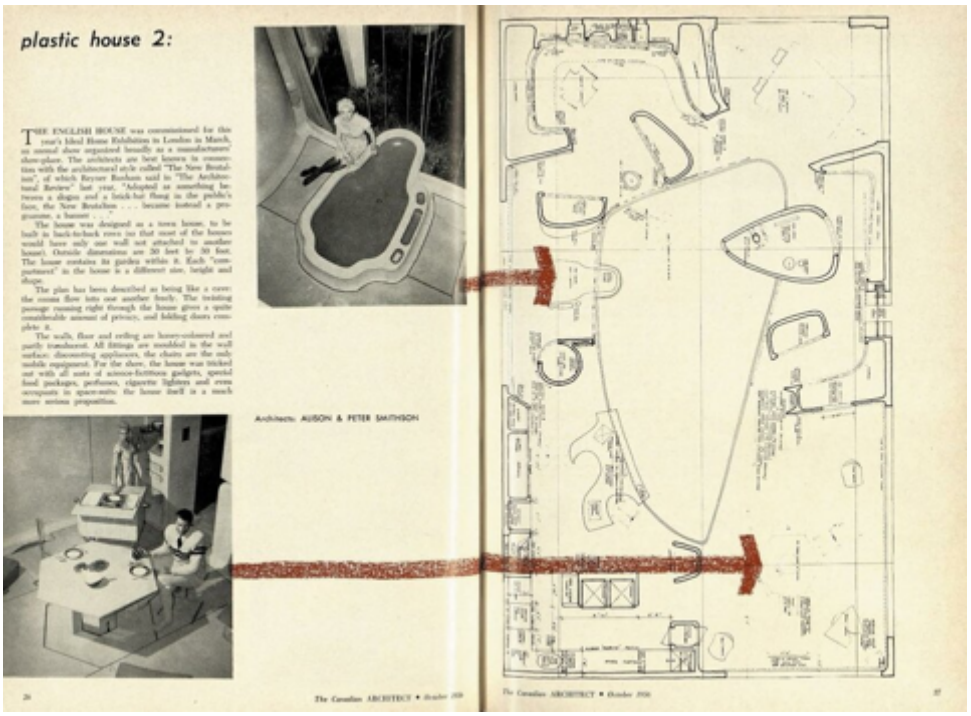

Figure 5.18. Alison and Peter Smithson, *The House of the Future,* 1956.[452] Peter and Alison Smithson unveiled the prototype for 'the House of the Future' at the Daily Mail Ideal Home Exhibition in 1956. It was made up of prefabricated three-dimensional components constructed out of plastic materials.

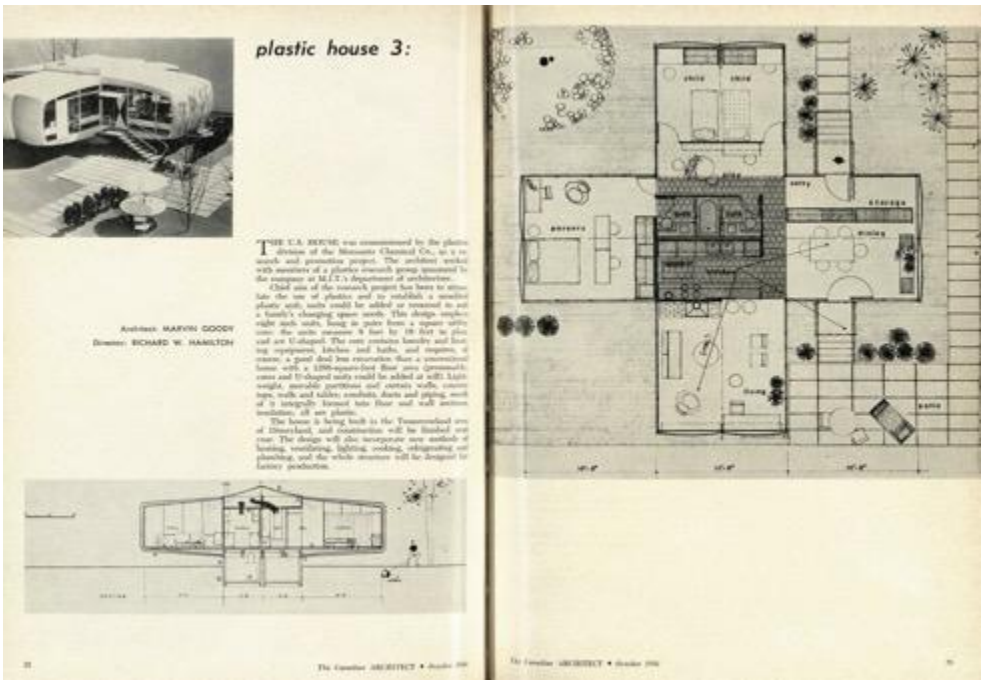

Figure 5.19. Richard Hamilton, Marvin Goody, and Albert G.H. Dietz, 'Monsanto House of the Future' project, 1958.[453]

[452] Ugo Rossi, 'Can Our [New] Cities Survive?', *Journal of Mediterranean Cities*. 2,1 (2022), pp. 1-14 (p.7), doi: 10.38027/mediterranean-cities_vol2no1_1. [accessed 10 December 2022].
For more about houses of the future, including the architects Alison and Peter Smithson's experiments, can see: Jurjen Zeinstra, 'Houses of the Future: 25 years of Critical Reflection on Architecture', *OASE*, 75 (2008), pp. 203–214,< www.oasejournal.nl/en/Issues/75/HousesOfTheFuture> [accessed 10 December 2022].
[453] Rossi, 'Can Our [New] Cities Survive?', p. 6.
For further information about the Monsanto House of the Future, please see: Monsanto Plastics, 'House of the Future', *Ekistics*, 5.28 (1958), pp. 14–17.

Figure 5.20. Material experiments developed in collaboration with Plastinor, 2022 © Marisa Ferreira/ Plastinor.

We made three initial tests with plastic waste to explore the aesthetics of melting plastics of the same colour (left), mixing plastics with different colours (centre) or combining the latter with the first to have a dominant blue colour with fragments from plastics with different colours (right). All the tests were carried out by Plastinor by using a rotational moulding technique in which the plastic is melted according to the mould shape. Functional additives were added to the discarded plastic to improve its physical properties and durability.

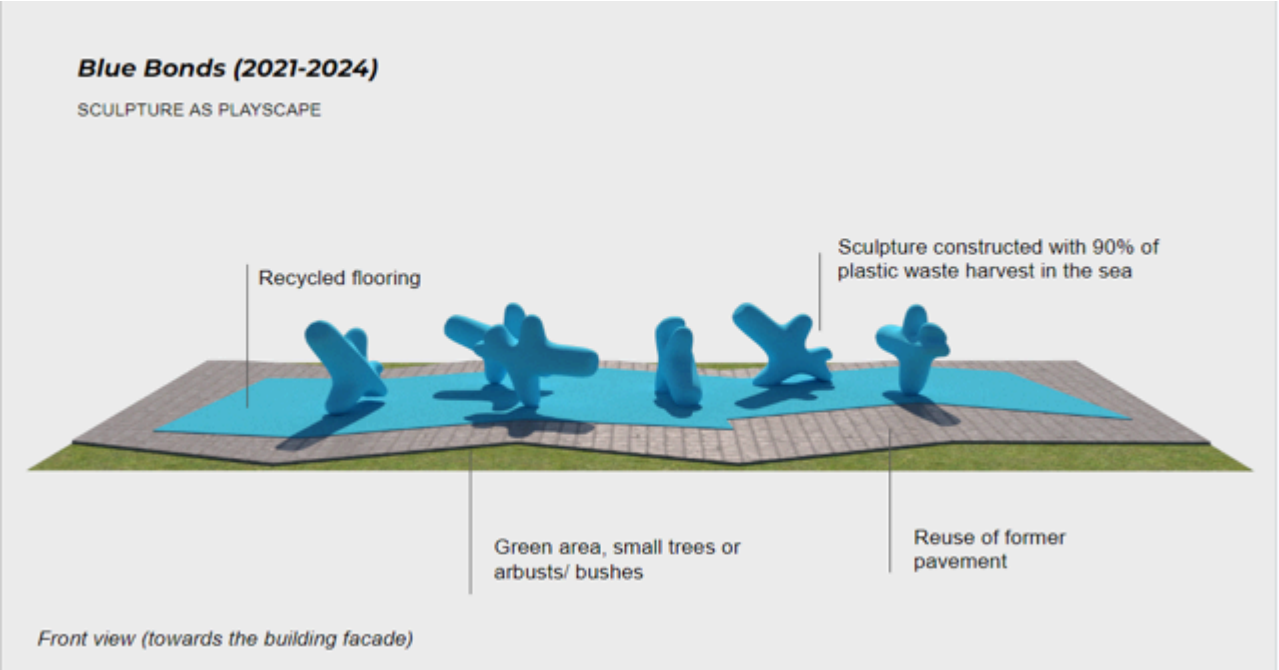

Figure 5.21. *Blue Bonds sketch,* 2022. One single sculpture, multiple possibilities. © Marisa Ferreira/ BONO.

Figure 5.22. Initial sketches for *Blue Bonds,* 2022. While the ground cannot safely be excavated because it is above a car park, we are currently redefining the landscape in order to build it up. © Marisa Ferreira/ BONO.

The urban interventions discussed in this chapter, *A Bigger Splash* and *Blue Bonds,* demonstrate two different methods of transforming waste into raw material for art production by presenting materials that range from natural stones to synthetic plastics: one is transformed through hand-made and experimental process, and the other through machine-made processes utilised in mass production. These prototypes not only reuse and repurpose waste: they are themselves 100 per cent recyclable in the future. The way they overlap raises concerns about how we continue to transform our cities without taking responsibility for deciding what to do with discarded material objects, and it shows that an interdisciplinary approach to transforming waste into another material can help us to develop different strategies for a more just and sustainable future. I examine waste in relation to Skien's urban and industrial development to question urban legacies, heritage, memories, remains, entropy, loss, material transformation, and the connections between the past, its contemporary reception, and future applications in the city. And by understanding our sensory and embodied everyday activities with 'otherness' (from the household waste we place outside at night to the objects we take to recycling facilities, the stones delivered to the storage facility awaiting their return to the city's urban space, or the waste dumped in the landscape to be incinerated), in which we experience the materiality of waste emotionally and physically, I also speak about the temporality of waste.

The space and time that waste occupies before being reused, recycled, repurposed, reimagined, incinerated, or filtered, made me comprehend a type of heterotopic feature that describes deep time in the city that is different from the 'heterotopic heritage values'' proposed by Torgrim Guttormsen in his 'deep cities' framework. Guttormsen purposes that the temporal traces of the past can be integrated into the cityscape by using Foucault´s six principles that identify heterotopic places[454] – 'deviation', 'temporality', 'multivocality', 'heterochrony', 'liminality', and 'illusoriness and compensation' – in order to distinguish four archaeological conceptualisations of urban heritage values: dissolution, collage, palimpsest and stratigraphy.[455] These four concepts are intended to be the basis for disseminating narratives, to engage us in different ways of implementing time and temporality in future sustainable cities. In the next section, I demonstrate how the practice enabled me to observe that the experience of otherness through waste and wasting practices also leaves traces in the urban space that accounts for the temporality of the

[454] The concept of heterotopic places originates from Michael Foucault's essay 'Of Other Spaces', 1967. It is quoted in Kalliopi Fouseki, Torgrim Guttormsen, and Grete Swensen, *Heritage and Sustainable Urban Transformations: Deep Cities* (Routledge, 2020), p. 39.
[455] Ibid, pp. 10, 40-48, 50. Table 1 in Chapter 5 p. 130 of this thesis offers an understanding of the differences between the four archaeological concepts proposed by Guttormsen and those I propose.

city's archaeological layers, and therefore these must also be acknowledged as having a heritage value. I suggest 'places of disposal' as a contribution to Guttormsen's heterotopic features, in order to read deep time in the city.

II. 'Places of disposal'

While walking in the city of Porto to prepare for a workshop I hosted at Católica University in May 2023, in collaboration with Eduarda Vieira and Patrícia Raquel Moreira, I decided to approach the city through Guttormsen´s four archaeological concepts,[456] and noticed that in the city of Porto (2023), as in the open-air stone storage facility in Skien (2021), our material waste and discards that occupy temporary spaces in the city are not considered in Guttormsen's proposal of 'heterotopic heritage values'. Guttormsen acknowledges that cities are built over layers of waste,[457] analysed through 'places of stratigraphy"' that allow us to learn about the past, but if waste and discards contain archaeological information about the way we live in the racialised capitalist world, even when waste is made (in)visible to give a certain order to the city, or to hide the environmental destruction taking place in 'extractive zones',[458] these temporary traces of waste and wasting practices left in the urban space are also topographic displacements. As Ida Danewid suggests,[459] research into the creation of global sustainable cities needs to include a racial theory of capitalism[460] in order to comprehend the existing geographies of power, racial capitalism and colonial economy that renders some people and places as 'disposable'[461] within the city's fabric. If waste holds information about our activities on Earth, then my suggestion for a heterotopic place[462] which I call a 'place of disposal' might address the potential of

[456] Fouseki, Guttormsen and Swensen, *Heritage and Sustainable Urban Transformations*, pp. 35-54. Guttormsen's four archaeological concepts that describe time in the city are: 'places of dissolution', 'places of collage', 'places of palimpsest' and 'places of stratigraphy'.
[457] Ibid., p. 48.
[458] Macarena Gómez-Barris, *The Extractive Zone. Social Ecologies and Decolonial Perspectives* (Duke University Press, 2017).
[459] Ida Danewid, 'The Fire this Time: Grenfell, Racial Capitalism and the Urbanisation of Empire', *European Journal of International Relations*, 26.1, pp. 289–313, doi: 10.1177/1354066119858388.
[460] As Lisa Lowe, in *The Intimacies of Four Continents* (Duke University Press, 2015), p. 150), suggests: 'capitalism expands not through rendering all labour, resources, and markets across the world identical, but by precisely seizing upon colonial divisions, identifying particular regions for production and others for neglect, certain populations for exploitation and still others for disposal'. Lowe is quoted by Danewid ('The Fire this Time'): 'some of the most radical changes to the globalising world are being written, not in the language of law and diplomacy, but rather in the spatial information of infrastructure, architecture and urbanism'.
[461] Marco Armiero, *Wasteocene. Stories from the Global Dump,* Elements in Environmental Humanities. (Cambridge University Press, 2021), pp. 10-11.
[462] Fouseki, Guttormsen, and Swensen, *Heritage and Sustainable Urban Transformations*, p. 10. The six principles of Foucault's concept of heterotopic places are used by Guttormsen to define the four

things to shed light on how we live in the city and the material choices we make through waste and wasting practices.

Thus, for me, the topic of wasting becomes entangled with 'heterotopic heritage value' when the principle of deviation (Guttormsen's principle 1) displaces the definition of waste (waste as matter out of time and place) according to its value that defines some bodies or places are valuable and others worthless.[463] A perspective on temporality looks at 'waste-time' and distinguishes between what is discarded and what is considered worth keeping. Within the conceptualisation of place, multivocality (principle 3) and heterochrony (principle 4) draw attention to the processes of production of surplus, accumulation, assemblage and sedimentation that are influenced by the modern concepts of growth, capitalist exploitation and development that produce the 'throw-away' approach. I believe that the study of wasting practices in the city is a crucial space for exploring issues of waste in relation to the global challenges created by capitalism.[464]

The 'liminal space' (Guttormsen's principle 5) that defines heterotopic place based on disposability as a conceptual mindset occurs when we experience a visual, tactile, auditory or olfactory perception of waste, pollution, excess and dirt that creates a kind of aesthetics of excess, expenditure, and waste, often experienced in marginalised areas of the city where incinerators, recycling facilities, dumping and landfill sites are usually located. Guttormsen's 'places of stratigraphy' and my 'places of disposal' might be interconnected in several aspects, but the latter seeks to define disposability as a heritage concept in urban planning by showing that the 'making' of global and sustainable cities is related to racialised forms of displacement, dispossession, spatial and social injustice and violence,[465] and the widening class inequality in the city. Here, the concept of disposability is used to make the case that social, political, and economic systems that create sustainable cities uphold power structures by discarding marginalized individuals, places, and objects. Thus, these places that define heterotopias have fragments and traces that

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archaeological conceptualisations of heterotopic places – dissolution, collage, palimpsest and stratigraphy. The principles are: 'deviation' (heterotopias detached from daily life); 'temporality' (heterotopias that change over time); 'multivocality' (heterotopias that juxtapose several places in one place); 'heterochrony' (heterotopias that are ensembles of things across all time); 'liminality' (heterotopias that require acts to be performed at the place), and 'illusoriness and compensation' (re-enactments).

[463] Draws inspiration from Thompson´s notion of 'value as a mutable social relation' to identify where privileged and less privileged people are placed in the city terms of areas of material flow, industrial production and waste management facilities.

[464] The accumulation of waste and the increasing extraction of fossil fuels and minerals on a global scale is a result of the great acceleration in the consumption of materials and energy fostered by the advent of capitalism.

[465] Danewid, 'The Fire this Time'.

symbolise the city's temporal history and enable the community to enjoy and be inspired by their surroundings through the aesthetics of decay, mixing / mess, shadows / absence, and layering, as suggested by Guttormsen,[466] but also through waste. (Table 1)

Table 1. Characteristic features of the four archaeological conceptualizations of heterotopic places[467] with my proposal for #5: 'places of disposal' (in blue)

Heterotopic characteristics	**#1: places of dissolution**	**#2: places of collage**	**#3: places of palimpsest**	**#4: places of stratigraphy**	**#5: places of disposal**
Deviation (1)	Abandonment	Admixture	Rewriting	Layering	Wasting
Temporality (2)	'Flaking off', putrefaction	Flattened time, 'cut-and-paste', nonlinearity, dissolved time	Layered flattened time, but with periods of the past "showing" through the surface	Layered compressed time, sequences and linear succession of time layers	'Waste-time', fluidity, transient time, *otherness, non-linearity*
Multivocality (3)	Anecdotic pluralism	Frenetic mess of ideas, concepts, and perspectives	Layered periods become intermeshed, such that one period is remembered through the lens of another	Material ordered strata with disordered things scattered in the soil, layer upon layer of different time periods	Dispersed, disposed, discarded by accumulation, 'Wasteocene'
Heterochrony (4)	Multiple elements of dissolving structures and things	Random mix of things and elements	Layered traces of things and elements no longer there	Layered fossilised actions frozen and sealed in time capsules	Layered (in)visible traces of disposal matter and bodies, sedimentation
Liminal space/ performative actions (5)	Modern ruins and abandoned places, such as industrial sites and harbour areas	Spaces where categorical boundaries are blurred and mixed, such as fun fairs, theme parks, bazaars and cabinets of curiosities	Spaces with heritage visualised as the absence of the past, the negative imprint of a past that is gone	Experience of 'looking down into the deep layered hole' in archaeological excavation sites	Spaces based on disposability and visualised as excess, surplus, discarded and dirt – e.g. recycling facilities, incinerators, dumping, landfill sites
Illusory or compensatory character (6)	Aesthetics of decay	Aesthetics of the randomly mixed or messy style	Aesthetics of the shadows of the past or ghosts on the wall as scarce relict traces	Aesthetics of compressed vertical snapshots of layered history	Aesthetics of otherness – excess, expenditure, waste

[466] Fouseki, Guttormsen and Swensen, *Heritage and Sustainable Urban Transformations*, p. 49.
[467] Ibid., p. 50.


Figure 5.23 Waste in the streets of Porto.
Figure 5.24. Sobrado dump, Penafiel, Portugal. © Rui Duarte Silva/ Expresso.
<https://expresso.pt/sociedade/2022-03-21-Recivalongo-impedida-de-depositar-residuos-biodegradaveis-no-aterro-de-Sobrado-em-Valongo-b7fb7316>

These spatial and temporal aesthetic engagements with materials that are simultaneously the landscape from where they originated, the temporal site they occupy and the future ruin they create, are a sort of layering or stacking of numerous landscapes, whether these are real or fictional. Focusing on our social role as artists and carriers for change, as suggested by Michel de Certeau, the practice suggests that the materiality of waste is critical: through it we can understand the relationship between class, race, politics, and the environment. By reframing perceptions of waste to move the processes of art production closer to a circular economy reflects the desire to reduce the social inequalities created by extractive practices and capitalist exploitation while promoting a critical, creative, and thoughtful engagement with issues of waste, consumption, and disposability. Here I reclaim, reimagine, and repurpose waste to demonstrate how found and discarded objects from the city can engage artists in developing new art methods that critically transform waste into a site for art production, while making waste visible and at the centre of urgent social, economic, and political debates about environmental depletion, spatial justice and urban sustainability. The practice developed in this chapter shows that sustainability is a fully integrated element of the creative thinking process, not a separate issue. In that sense, new possibilities for art production developed through exploratory and speculative practices must be seen as a way towards meeting present needs while ensuring those of future generations are also met, as suggested in the Brundtland Commission's report in 1986.[468]

[468] The report *Our Common Future* put forth the very general notion that sustainable development consists of economic development activity that 'meets the needs of the present without compromising the ability of future generations to meet their needs'. The report, that became known as Brundtland Commission (Gru Harlem Brundtland is the former Norwegian prime minister) also defines the three overlapping elements of sustainability: Environment, Economy and Equity.

By delving into memory, pollution, entropy, and the aesthetics of otherness, the art interventions developed in this chapter address 'waste as things',[469] a material source for artistic creation and inspiration that celebrates the discarded, contests standards of beauty and normativity, defies standardisation, excess, decay, and order, and engages in experimentation, speculation, and the rejection of uniform perfection. It is a gesture of inclusion, resilience, care, and an attempt at material and spatial reconstitution. These case studies thus demonstrate an aestheticisation of waste arising from the ability to perceive 'waste as things', that can move waste from a state of being valueless into something that is seen as inclusive and with cultural potential. This suggests that my role as artist seeking spatial justice through urban regeneration must involve uncovering and challenging these unjust geographies by developing innovative, creative and speculative approaches to reimagine new materialisms that tell stories of a new 'set of abandoned futures'.[470]

My engagement with the materiality of waste and its transformation into a 'durable'[471] created a new materiality that aims to offer a different perspective on Robert Smithson's idea of entropy. Rather than seeing entropy as a measure of 'disorder', the practice developed in this case study addresses entropy as a dynamic and creative force that generates new forms and possibilities and transforms and reorganises 'waste as things', while shifting the materiality of waste away from the irreversible and negative forces of decay and dissolution into new structures of value (and order) of an involving and interconnected system of material entities.

World Commission on Environment and Development, *Our Common Future* (United Nations, 1986), p. 39. <sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf> [accessed 23 April 2023].

[469] Hawkins, *The Ethics of Waste,* p. 73.

[470] Robert Smithson's notion of entropy as being the 'memory-traces of an abandoned set of future' is quoted by Simon O'Sullivan in Simon O'Sullivan. (2017) 'Fictioning the Landscape: Robert Smithson and Ruins in Reverse', *Fiction*, 3.2. (2017), p.63. <www.simonosullivan.net/articles/Robert_Smithson_and_Ruins_in_Reverse.pdf>

[471] Thompson, *Rubbish Theory*, p. 4.

VISUAL ESSAY

Spaces of Otherness - "Deep Cities".

Waste temporalities in the city.

> *The yet to be disposed of objects in ruins have been identified as 'waste', an assignation which testifies to the power of some to normatively order the world, but also is part of an excess, impossible to totally erase, which contains rich potential for reinterpretation and reuse because it is under-determined.*
>
> — Tim Edensor[1]

The visual essay employs Guttormsen's 'deep cities' framework to think about traces of material otherness in urban settings as heritage. The essay results from a group walk workshop that aimed to challenge linear perception of waste-value and recognize waste with heterotopic heritage value.

We leave the Catholic University of Porto building and I immediately realise that I am walking not through the streets of Porto but through the city's temporal layers. My journey from the university in Foz down to the river and up again is not marked by its tourist sites, fancy restaurants or brand-new property developments; instead, I step into the overlooked and the discarded to bring Guttormsen's 'deep cities' framework[2] into dialogue with the material, spatial and temporal dimensions of waste. I am inspired by Mats Burström's suggestion of 'ruin waste' as a site of creative potential,[3] due to its fragmentary nature and its fluid state of material becoming that generates this 'otherness' that takes these 'wastespaces' into a marginal position in relation to the normative spaces of the city.[4] Along with Edensor's vision of ruins as transformative, I thus embrace the 'marginal' through its materiality.

Heterotopic Heritage Value #1:
"Places of Dissolution".

As I walk along the main road that divides the wealthy downtown area of Foz from the concrete blocks of social housing, my eye is caught by a concrete white house transformed by the 'collaboration' between time and nature.[5] I pause, fascinated by its quiet complexity. So much is happening. I think of Caitlin DeSilvey's idea of decay as being not only an 'erasure' but also a process that generates a distinct kind of knowledge.[6] Here, decay becomes a kind of language that makes visible the interconnectedness of the natural and built environments, through the agency of the 'other-than-human and their engagements with matter, climate, weather, and biology'[7] that creates this material 'otherness' through an ongoing process of transformation.

Heterotopic Heritage Value #2:
'Places of collage'.

As I walk, the streets continue unfolding as if each layer of the city's 'deep time' reveals overlapping narratives shaped by time. These layers of history press on each other, resisting the shift between Thompson's categories of value. I find it difficult at times to distinguish Guttormsen's heterotopic features, as urban fragments contain in themselves different stories that seem to coexist in their continued transformation. I wonder about what stories and aesthetic and material value the multiple temporalities of 'wasted places' in the city can tell us about the past, present, and future? I look at these 'urban assemblages' and imagine waste's material potential to go beyond its marginal status. These urban assemblages are not something to be discarded, but an integral part of the city's identity, aesthetics and memory, as well as its temporalities.

Heterotopic Heritage Value #3:
'Places of palimpsest'.

Each layer of the city's ongoing development reveals a hidden layer beneath it, giving the impression of an endless palimpsest. But these palimpsests are not limited to the real world – they extend into my imagination, as if these layers of the city blur the boundaries between truth and fiction, memory and reality, present / past / future. The remaining marks can also be perceived at different scales, from large buildings to small arrangements on the pavement, testifying that waste matter can be displaced and transformed, but never erased.[8]

Heterotopic Heritage Value #4:
"Places of stratigraphy".

I am now by the river. I pass by different material traces that contain stories of the city; however, this space triggers my curiosity because I find it challenging to define. The boundaries between Guttormsen's heritage features seem to blur and overlap. Sometimes a space unfolds as a palimpsest evoking the past through remaining traces. However, the ground excavation takes me to what is under the surface and its multiple sedimented layers of hidden stories and transformations. At the back of the space, I see a wall transformed into a tapestry (or assemblage) of material fragments that transform the city into dynamic spaces where materiality and change coalesce. These may also highlight how the discarded parts of the city can be repurposed into an 'imperfect' and 'disordered', yet harmonious, wall.

Heterotopic Heritage Value #5:
Towards a theory of 'Places of disposal'.

As I walk up the main road, my eyes observe a large collection of abandoned household items just outside the university's car park.

As I get closer, what appears to be random juxtaposed and stacked objects are transformed into a shelter, a home. I see that these material traces left by waste and wasting practices[9] in the urban setting blend with the natural world and provide ways to analyse structural forms of power, class, exclusion, injustice, and inequality. I note that discarded material and waste that occupy temporary spaces in the city are not considered in Guttormsen's proposal of 'heterotopic heritage values'.[10] I propose **places of disposal** as a contribution to Guttormsen's heterotopic features, in order to read 'deep time' in the city.

While Guttormsen's 'places of stratigraphy' looks at waste layers (strata) in geological formations to reveal what societies consumed, produced and valued, **'places of disposal'** focuses on the temporary geographies waste occupies within the city before it is removed from sight, delivered to a recycling facility or dumped in a landfill site, to acknowledge the heritage value of waste materials temporarily sedimented in the urban environment. These might be either dispersed, disposed of, or discarded by displacement, accumulation, or contamination.

ENDNOTES

1] Tim Edensor, 'Waste Matter - The Debris of Industrial Ruins and the Disordering of the Material World', *Journal of Material Culture*, 10.3 (2005), pp. 311-332, doi: 10.1177/1359183505057346.

2] Fouseki, Guttormsen and Swensen, *Heritage and Sustainable Urban Transformation*.

3] Mats Burström, 'Looking into the Recent Past Extending and Exploring the Field of Archaeology', *Current Swedish Archaeology,* 15-16 (2009), p. 28. <http://www.diva-portal.se/smash/get/diva2:274357/FULLTEXT01.pdf> [accessed 20 July 2022].

4] Caitlin DeSilvey and Tim Edensor, 'Reckoning with Ruins', *Progress in Human Geography*, 37 (2013), pp. 477, 465-485.

5] Anna L. Tsing, *The Mushroom at the End of the World. On the Possibility of Life in Capitalist Ruins. (*Princeton University Press, 2015). p. 27.

6] = Caitlin DeSilvey, 'Observed Decay: Telling Stories with Mutable Things', *Journal of Material Culture*, 11.3 (2006), pp. 318–338 (p. 323), doi: 10.1177/1359183506068808.

7] Martin Jones, 'Environmental Archaeology', in Colin Renfrew and Paul Bahn (eds) *Archaeology: The Key Concepts* (Routledge, 2005), pp. 85–89 (p. 85).

8] Tim Edensor, 'Waste Matter - The Debris of Industrial Ruins and the Disordering of the Material World', *Journal of Material Culture*, 10.3 (2005), pp. 311-332, doi: 10.1177/1359183505057346.

Joshua Reno, 'Your Trash is Someone's Treasure: The Politics of Value at a Michigan Landfill', *Journal of Material Culture*, 14.1 (2009), pp. 29-46, doi: 10.1177/1359183508100007.

9] Marco Armiero, *Wasteocene. Stories of the Global Dump.* Elements in Environmental Humanities. (Cambridge University Press, 2020).

10] Fouseki, Kalliopi & Guttormsen, Torgrim & Swensen, Grete.Chapter 1: *Heritage and sustainable urban transformations: a 'deep cities' approach.* (Routledge, 2020).

Acknowledgements

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Participating scholars: Ana Gago, Carlota Miguel, Cristina Sá, Eva Rebelo Armada Direito, Mariana Rocha, Mário Pastor, Marisa Ferreira, Patrícia Monteiro, Patricia Raquel Moreira, and Pedro Andrade. The booklet developed as part of the workshop can be found in the accompanying materials of the thesis.

CONCLUSION

Considering the overwhelming global expansion of landfill sites and waste dumps, the growing global trade in waste, and concerns about environmental depletion and climate change, I have highlighted that the recategorisation of waste as a valuable resource is more urgent than ever, as it contributes to an idea of progress that takes care of the planet, acknowledges all living forms, and contributes to spatial justice. I have proposed new ways to reinscribe waste with value by developing speculative methods and alternative futures[472] for urban planning projects in an effort to contribute to material and spatial reconstitution. The research proposes the materiality of waste as racial to acknowledge waste's capacity to testify colonial geographies and challenge historical truths; it acknowledges 'places of disposal' as heterotopic features with heritage value. I also suggest that material 'otherness' holds subversive potential to inspire social change and offers possibilities to reimagine waste matter as a resource for artistic expression by envisioning transformative ways to incorporate waste into urban settings. These suggest a speculative future in which waste is reused, recycled, repurposed, and valued as a critical material to rethink urban development and advance spatial justice. Through this research, I have reimagined the role of the artist in urban planning and questioned established urban planning paradigms to call for new public art policies that contribute to a more sustainable, just, and empathetic urban future.

The research has addressed a knowledge gap resulting from the failure to identify waste as a critical material to advance spatial justice. In order to address this oversight, I propose that this gap is filled by 'otherness as a creative framework' to challenge spatial injustice and reimagine the subversive potential of waste as a valuable resource for urban transformation. Through theoretical and practice-led methodologies, I suggest the materiality of waste as racial to acknowledge that the perception of waste is shaped by practices of othering and wasting practices that discard people and places.[473] The research questions linear perceptions of waste-value and waste-time ('places of disposal'), and proposes speculative alternatives for urban planning that aim to recategorise waste as a valuable resource for artistic expression as a way of advancing material and spatial reconstitution.

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[472] Dana Cuff and others, *Urban Humanities. New Practices for Reimagining the City* (The MIT Press, 2020), p. 179.
[473] Marco Armiero, *Wasteocene. Stories from the Global Dump*, Elements in Environmental Humanities. (Cambridge University Press, 2021), pp. 9-10.

My approach has moved between practical and theoretical methodologies, I have employed speculative mapping as a creative, exploratory, and critical methodology to explore the complexity of waste and combine scientific enquiry with artistic expression to offer new ways of engaging with landscapes that are often marginalised. This methodology has enabled me to bridge practice and academic research, develop speculative possibilities for exploring 'otherness' and reimagine waste-value and waste-time, and their potential to create alternative futures capable of advancing spatial justice. Speculative mapping has functioned as both method and methodology during the research journey, and I frame it as a methodology that connects two purposes: first, an interdisciplinary spatial analysis with a speculative framework for analysing complex landscapes, and second, a creative method for reimagining the transformative potential of waste in urban settings. This dual and critical approach to 'wastescapes' has enabled me to suggest waste as an 'emergent alternative'[474] for urban planning that aims towards material and spatial reconstitution.

I traced waste across different geographies, focusing on its material and temporal dimensions, including 'spaces of otherness' (Porto, Skien), spatial and environmental injustice (Covas do Barroso; Langøya; The SAAL Project, Oeiras), and toxic legacies (Langøya). I observed that the process of 'othering' someone or something creates a safe and worthy 'us', as Rebecca Solnit and Armiero also note,[475] and I have proposed the materiality of waste as racial to challenge practices of othering used for capitalist accumulation[476] and to critically demonstrate that the uneven impact and harm of extractive practices and 'toxic heritage'[477] across geopolitical boundaries significantly influences the ways we perceive and engage with waste. I have adopted a forensic approach combined with archaeological methods, informed by Susan Schuppli's work on 'material witnessing',[478] Weizman's approach of 'investigative aesthetics' and the notion of

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[474] Adrienne Maree Brown, *Emergent Strategy. Shaping Change, Changing Worlds* (AK Press, 2017), p. 5.
[475] Rebecca Solnit, cited in Armiero, *Wasteocene,* pp. 10, 31.
[476] Armiero, *Wasteocene,* p. 38.
[477] Anna L. Tsing and others' idea of the 'patchy Anthropocene' and the writing of Ulrich Beck suggests that the impact of the hazards created by the 'risk society' is uneven across geographical boundaries. Dean Curran, 'Beck's Creative Challenge to Class Analysis: from the Rejection of Class to the Discovery of Risk-class', *Journal of Risk Research*, 21.1 (2018), pp. 29-40, p. 36, doi: 10.1080/13669877.2017.1351464, while Sarah May and Kryder-Reid address toxic heritage as a planetary phenomenon in their introduction text of their book: Sarah May and Elizabeth Kryder-Reid, *Toxic Heritage. Legacies, Futures, and Environmental Injustice.* (Routledge, 2024), p. 2.
Anna L. Tsing, Andrew Mathews and Nils Bubandt, 'Patchy Anthropocene: Landscape Structure, Multispecies History, and the Retooling of Anthropology', *Current Anthropology*, 60(S20) (2019), pp. 186-197, doi: 10.1086/703391.
[478] Susan Schuppli, *Material Witness. Media, Forensics, Evidence.* (The MIT Press, 2020).

sense-making as research data,[479] and Robert Smithson and Michael Shanks' writing on 'the archaeological imagination' to examine both material aesthetics and its capacity to document past events.[480] This approach enabled me to identify waste as a material witness[481] of colonial legacies and to develop different forms of evidence, documentation, and counter-narratives. My fictional text 'Notes on a Journey to Covas do Barroso' (2021, Chapter 3) narrated a speculative journey to Covas do Barroso and marked the beginning of my desire to translate movement into writing as an act of witnessing and documenting a site. I used (drone) photographs, object analysis under the microscope, a group walk, 'Untold Climate Stories' (2024), and transmediation to translate what I experienced or observed empirically and performatively into writing, a process that blurred the real, the imaginative, and the fictional.[482] This interdisciplinary approach allowed me to recognise waste as an integral part of the landscape (whether visible or not) and understand that waste can be displaced but 'never truly disposed of'.[483]

The thesis includes a series of new artworks: photography, site-writing, sculpture, and public art (for a more detailed overview, see the attached 'Review of Practice') that have allowed me to engage with the research questions by exploring ideas and materials that examine the ways we perceive and engage with waste. The question '**How do we perceive and relate to waste?'** has been explored experimentally through the walking project 'Spaces of Otherness. Deep Cities' (2023) with a group of researchers from the Catholic University of Porto, in which we employed Guttormsen's 'deep cities' framework of heritage values.[484] During my preparation for the walk, I observed that Guttormsen's framework failed to account for the temporal spaces that waste occupies in the city as part of its heritage. I proposed 'places of disposal' as heterotopic spaces with heritage value and the capacity to reveal ongoing 'practices of othering' beyond the city's geological strata.

I have also considered this question in relation to Robert Smithson's idea of

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[479] Matthew Fuller and Eyal Weizman, *Investigative Aesthetics. Conflits and Commons in the Politics of Truth* (Verso, 2021), p. 29.
[480] Schuppli, *Material Witness,* p. 9.
[481] Schuppli, *Material Witness.*
[482] Simon O'Sullivan. (2018) 'Fictioning the Landscape', *Journal of Aesthetics and Phenomenology* 5.1 (2018), pp. 53-65, doi: https://doi.org/10.1080/20539320.2018.1460114 and Simon O' Sullivan, (2017) 'Mythopoesis or Fiction as Mode of Existence: Three Case Studies from Contemporary Art', *Visual Culture in Britain*, 18.2 (2017), pp. 292-311, doi: https://doi.org/10.1080/14714787.2017.1355746.
O' Sullivan's idea of 'fictioning' as a performance blurs the reality/ fiction boundary.
[483] Reno, 'Your Trash is Someone's Treasure'.
[484] Fouseki, Guttormsen and Swensen, *Heritage and Sustainable Urban Transformations,* p. 50.

'sedimentation'. In his 1968 article 'A Sedimentation of the Mind: Earth Projects',[485] Smithson explored ways of seeing and understanding the entangled relationship between mind and matter by drawing our sensory and imaginative attention towards the materiality of the Earth's strata and by suggesting that our cognitive and creative processes resemble the process of the Earth's geological movements. Smithson's idea of the integration of art with natural transformations as a geological layering over time ('abstract geology') has enabled me to examine how the materiality of waste affects, and is affected by, its entanglement with humans, non-humans, and nature as part of a web of life, following Haraway, Tsing, Müller, Edensor, Armiero, and Bennett.

This line of enquiry was then developed through the question: '**How does waste intersect with broader systems of power and inequality?'** This study explored the intersection of waste and power in Covas do Barroso in Portugal and Langøya in Norway to analyse how power dynamics shape landscapes and communities. This element of the research was led by practice and looked at Colin Renfrew's idea of 'material engagement'[486] to explore the active role that material objects play in shaping how people think, create, and understand the world in a reciprocal relationship between people and their material world. The walks in Covas do Barroso (2021, 2022, 2024) and the archival images of Langøya enabled me to identify waste (mine tailings and toxic waste) as a silent witness to the complex relations between people and nature and an integral part of the landscape. This refutes the idea that humans and nature are two separate entities and presents material traces as dynamic forces, not just as material remnants of the past. Furthermore, Shanks' work on the 'archaeological imagination'[487] that I understood as a method that addresses 'archaeology as a reflexivity process',[488] along with Susan Schuppli's idea of 'material witnessing'[489] and her forensic approach to analysing past events through material traces have been central to my understanding of the creative role that archaeology plays in uncovering, analysing, and interpreting remaining material traces.

I have also considered issues related to who controls space, who has access to it, who is

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[485] Robert Smithson, 'A Sedimentation of the Mind: Earth Projects*'' Artforum*, September 1968.
[486] Colin Renfrew, *Figuring it out: The Parallel Visions of Artists and Archeologists* (Thames & Hudson, 2003).
[487] Michael Shanks, *The Archaeological Imagination* (Left Coast Press/Routledge, 2002).
[488] Although Shanks does not refer to his work as 'reflexive', by looking at the creative process of uncovering, analysing and interpreting it, he is addressing archaeology as a process of reflexivity that challenges the idea of the archaeologist as an entirely objective observer and acknowledges that their own cultural, theoretical, methodological and personal perspectives shape the research process and the critical analysis of their own contribution to knowledge production.
[489] Schuppli, *Material Witness.*

excluded, who shoulders the burden of it or benefits from it by intersecting fieldwork and practice with environmental studies on 'green extractivism'[490] This approach provided a close reading of the role of the power dynamics between Savannah Resources, the Portuguese government, the European Union, activists and local communities in shaping human experience and physical spaces with political and ideological influences. The work developed was part of two individual exhibitions: 'Notes of a Journey. On Matter, Extractivism & Displacement' at Galeria Presença, Portugal (March - May 2022) in collaboration with the artist Carmen Mariscal, and 'An Archive of Evidence' at Hå Gamle Prestegård, in Norway (November 2022 - January 2023). These two exhibitions allowed me to experiment with ways to narrate the multi-layered landscapes of Covas do Barroso (e.g., counter-maps, material samples, objects, photography, and fictional text) that together privilege speculative mapping as a methodology that is both analytical and imaginative, capable of rendering the past, present, and future.

This study of power dynamics was further developed during my SPACEX secondment in Portugal (March 2024). My practice looked at Edward Said's concept of 'imaginative geographies'[491] to explore techniques of representation, conversations, and creating images that both reflect and enable relations of power as a way of exploring the narratives and policies that helped to justify the extraction of lithium in Covas do Barroso. This approach focused on the emotional, lived experiences and the political aspects of the interactions between subjects and sites of extraction through observations, speculations, and fragments of stories / lived experiences that together helped to define the Barroso (and Langøya) landscapes as 'geopolitical spaces'.

This work in Covas do Barroso led to a booklet, *Untold Climate Stories* (in the appendices) and to the presentation of a paper, 'Untold Climate Stories: Towards a Political Understanding of the "White Gold" Landscapes' at the doctoral conference 'Between Landscapes/ New Aesthetics' at the Institute of Landscape Architecture, in cooperation with Prague City Gallery, October 23-24th 2024. My paper focused on the interdisciplinary methods I employed to map the multi-layered stories of lithium mining in Covas do Barroso, Portugal. Through conversations with other conference participants, I noted that by using the term 'speculative mapping' rather than 'mapping' I was able to acknowledge

[490] Alexander Dunlap and Mariana Riquito, 'Social Warfare for Lithium Extraction? Open-pit Lithium Mining, Counterinsurgency Tactics and Enforcing Green Extractivism in Northern Portugal', *Energy Research & Social Science* 95. 102912 (2023), pp. 1-21.
[491] Edward Said, *Orientalism* (Random House, 1978). Edward Said defines 'imaginative geographies' as ways of representing and talking about places and spaces that both reflect and permit relations of power.

the speculative, imaginative, and exploratory nature of my study and better explain its future-oriented methodological approach. This allowed me to build my argument that speculative mapping is a methodology that connects two purposes: first, an interdisciplinary spatial analysis with a speculative framework to analyse and understand complex landscapes; and second, a creative and speculative method (future-oriented) to explore possibilities of reinscribing waste with value.

The notion of otherness led me to ask: **How can waste question historical truths?** and **How do waste, 'racial capitalism', colonialism and the Anthropocene intersect in the construction of the other?** I have addressed these questions by exploring othering through practice, case studies, visual essays, and theory in the work of Edensor ('ruin waste', 'material otherness'), Vergès (the 'racial Capitalocene'), Yusoff ('white geology'), Thompson ('waste value'), Armiero (the 'Wasteocene'), May ('toxic heritage'), and Tsing ('toxicity'). I analysed power dynamics and the histories of Covas do Barroso in relation to economic dispute, popular resistance, and ecological crisis and documented the invisible/ visible impact of extractive practices in the region. This work is developed in Chapter 3 and in 'Untold Climate Stories'. My practice research identified 'sedimented waste' (mine tailings) as a source of knowledge about colonial legacies in the 'white gold' landscape by recognising the discarded mine tailings deposited on the terrain as tangible traces of extraction and as testimonies of the stories of displacement, erasure, and dispossession that have shaped the Covas do Barroso landscape. This approach frames practice as both expression and knowledge production, an approach strongly aligned with Matthew Fuller and Eyal Weizman´s work on investigative aesthetics, and more precisely the notion of sense-making as research data.[492]

I have also addressed practices of othering through the Langøya case study and highlighted the separation of the human from nature as part of the colonial mindset in order to justify the exploitation of its resources and harmful toxic legacies.[493] As with the case of Covas do Barroso, I addressed Jane Bennett's notion of 'vibrant matter' to examine the intrinsic vitality, or 'liveliness'[494] of waste in order to reveal the unequal distribution of 'burdens' and 'benefits' that often accompany prevailing political and corporate narratives. The visual essay 'Losing the Right to Breathe. Waste Stories of

[492] Fuller and Weizman, *Investigative Aesthetics,* p. 29.
[493] Max Liboiron, *Pollution is Colonialism* (Duke University Press, 2021). This idea is addressed in Chapter 1 'Land, Nature, Resource, Property', in which Liboiron outlines 'the historical and conceptual foundations for the invention of modern environmental pollution as a colonial achievement'.
[494] Jane Bennett, *Vibrant Matter. A Political Ecology of Things* (Duke University Press, 2010), p. xvi.

Dumping' (Chapter 5) demonstrated how the tangible scars and traces of industrialisation (e.g., soil, water and air pollution, toxic contaminants, displacement, the destruction of non-human habitats, deforestation) have created permanent changes to the topography of the island of Langøya. These practice-led works in Covas do Barroso and Langøya have contributed to an understanding of how environmental violence, uneven power dynamics, and the exploitation of both natural resources (lithium) and communities have been justified in the name of the 'green transition'. This analysis also strengthens my argument that waste materiality can challenge historical truths by demonstrating that the capitalist approach is often led by colonial legacies that separate humans from nature to justify the exploitation of its resources.[495]

I have also investigated othering in relation to the lived experience of those who live in / with / through waste. I have examined how waste influences our social relations through the 'Wasteocene'[496] in which Armiero frames 'waste as wasting', a socio-ecological relation that creates 'wasted people' and 'wasted places'.[497] The study shows different ways in which waste is entangled with the production of inequalities through systems that maintain power by discarding certain people, places, and things,[498] including the uneven exposure to pollution and toxic heritage (Langøya), capitalist exploitation and the uneven distribution of benefits (Covas do Barroso), and categories of value that render people and places as either 'worthy' or 'worthless' ('places of disposal'). These visual essays depart from the idea that waste is a cultural phenomenon marked by time,[499] space,[500] and notions of value.[501] This analysis of the ways we engage with waste has helped me to understand the value of spatial and temporal enquiry for recognising that waste geographies affect the way we read and experience urban space and spatial justice. This strengthens my overall argument that calls for a reimagining of otherness and the transformation of waste into a valuable material to advance both spatial and material reconstitution.

This study led me to analyse the SAAL Project. Emerging from my SPACEX secondment in Portugal, the visual essay 'The SAAL Project' examines the concept of 'practices of othering' in relation to social housing access in the two years after the 1974 military coup

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[495] Liboiron, *Pollution is Colonialism.*
[496] Armiero, *Wasteocene,* pp. 2, 9-10.
[497] Ibid, p. 9-10.
[498] Liboiron, *Pollution is Colonialism.*
[499] William Viney, *Waste. A Philosophy of Things* (Bloomsbury Publishing,2014), pp. 2, 19.
[500] Mary Douglas, *Purity and Danger: An Analysis of Concepts of Pollution and Taboo* [1966], (Routledge, 2002), pp. 36, 2.
[501] Michael Thompson, *Rubbish Theory. The Creation and Destruction of Value* (Pluto Press, 2017), p. 4.

in Portugal. I employed archival research, visual documentation, and site walking (investigative aesthetics) to study spatial injustices and critically reflect on the ways that colonial power and urban policies rendered some communities as 'disposable' by exposing processes that devalued them. I analysed different SAAL neighborhoods in Oeiras, Lisbon, and I noted that although the SAAL Project purported to be a participatory and democratic process that allowed marginalised communities to participate in the process of reclaiming space, the SAAL Project in Oeiras reinforced the argument that colonial legacies render 'the other' (Blackness) as less valuable or deserving of resources (housing). I refer to the Pedreira dos Húngaros neighbourhood to demonstrate the historical devaluation of Black bodies[502] and spaces that affect who has access to resources and affordable housing. This study showed that spatial injustice is linked to socio-ecological relations that render some places and some groups as worthless, and therefore 'disposable'.[503] This strengthens my overarching suggestion that 'otherness as a creative framework' challenges spatial injustices by uncovering and raising awareness of the practices that create and maintain them.

The visual essays at the end of Chapters 2-5 function as spatial and visual modes of knowledge. Through the walks, site-writing, material engagement, and photographs that compose these visual essays, I explore ideas and lines of enquiry that arose from my own aesthetic and multi-sensory relationship with the environment. These have helped me to articulate embodied thinking and movement through writing in which I combined the real, the fictional, and the imaginative at different scales and levels of complexity. Therefore, I adopted the form of visual essays at the end of the thesis chapters to highlight ways in which my speculative practice research has produced embodied knowledge (performative research)[504] that has helped my research progress and allowed me to bridge practice and academic research.

This study also outlines the knowledge exchange experienced through SPACEX-Rise[505] secondments and training days (2021-2024), through which I was able to learn and speculate about ways that spatial practices encourage empathetic and inclusive ways of living together. These conversations during my PhD journey enabled me to develop an

[502] Kathryn Yusoff, *A Billion Black Anthropocenes or None*. (University of Minnesota Press, 2018), pp. 76, 79.
[503] Armiero, *Wasteocene,* p. 10-11.
[504] Barbara Bolt, 'Artistic Research: A Performative Paradigm?' *Parse Journal*, 3 (2006), pp. 129-142. <https://www.mdw.ac.at/ar_center/wp-content/uploads/2020/09/Barbara-Bolt_Artistic-Research_A-PerformativeParadigm_PARSE_Issue3.pdf> [accessed 8 June 2025].
[505] For a research overview of SPACE-Rise see: SPACEX, <https://www.spacex-rise.org/overview> [accessed 15 August 2024].

interdisciplinary approach to spatial practices as a way of mapping and communicating otherness and life in the city.

By examining the different ways that otherness is experienced in the city, this study raises the following questions: **How might the experience of otherness be reimagined?** and **How can public art challenge the ways we perceive and relate to waste to strive towards material and spatial reconstitutions?** The study of Covas do Barroso, Langøya, and the SAAL Project analyse ways in which marginalised communities and places are discarded or devalued and therefore perceived as 'waste'. I highlight connections between waste and inequality in three different places and I suggest methods to transform waste into a resource to create alternative futures[506] in order to challenge these inequalities and create more just and sustainable urban spaces. These are investigated through a series of prototypes and small objects titled *Deep Wounds* (2022-) and two large public art projects *A Bigger Splash* and *Blue Bonds*.

Deep Wounds is a series of experimental prototypes, drawings, and small objects made with different materials and often informed by industrial processes and action verbs to highlight the forces of extraction (e.g., digging, collecting, drilling, excavating, layering, mixing, assembling). These works drew inspiration from archival engineering drawings of drilling technology and were first exhibited in my solo exhibition 'An Archive of Evidence' (2022) at Hå Gamle Prestegård, Norway, together with drone photography of Covas do Barroso, to call attention to the interconnections between extraction and the development of drilling and survey technology that enables multinational corporations to search, prospect for, and extract natural resources in distant geographies. These works shift the perception of waste from being 'valueless' to being a 'thing',[507] and present waste as a site for creative reinterpretation and transformation[508] in a contemporary art context.

This speculative and creative approach to waste as a medium for reimagining otherness was also explored in the case study 'Kverndalen in New Light', an urban regeneration project taking place in Skien, Norway, where I have been developing two large public art projects: *A Bigger Splash* (2020-) and *Blue Bonds* (2021-). (Chapter 5) The case study undertook a historical and spatial analysis of the city and explored speculative thinking as

[506] Dana Cuff and others, *Urban Humanities. New Practices for Reimagining the City* (The MIT Press, 2020), p. 179.
[507] Hawkins, *The Ethics of Waste,* p. 73.
[508] Tim Edensor,'Waste Matter - The Debris of Industrial Ruins and the Disordering of the Material World', *Journal of Material Culture*, 10.3 (2005), pp.311-332, doi: 10.1177/1359183505057346.

a way of creating new possibilities, methods and processes for reinscribing waste with value. I addressed the materiality of waste as an 'emergent alternative'[509] to extractive capitalism, capable of challenging structures of power and social order to stimulate change and advance spatial justice in the city.[510] While *A Bigger Splash* transforms waste and leftover material through hand-making and experimental processes, *Blue Bonds* employs a machine-made process utilised in mass production. I explored techniques of melting, reshaping, and repurposing discarded plastic to develop new methods for art production that explores processes of reuse, recycling or upcycling through existing technologies that are normally used for the production of by-products for other industries. The practice developed through the two projects enabled me to explore ways to reimagine waste as a site of transformation and develop alternatives to reinscribe waste with value: I reclaimed, reimagined, and repurposed waste to demonstrate how found and discarded objects from the city can engage artists in developing new art methods that critically transform waste into a site for art production, while making waste visible and at the centre of urgent social, economic and political debates about environmental depletion, social justice and urban sustainability. This process reflected the artist's role in cities undergoing urban transformation and highlighted the need for new public art policies that challenge spatial injustice and advance spatial and material reconstitution.

Future research could examine other cities and extractive landscapes and contrast them with the findings in the thesis to explore new ways to engage with waste and otherness. It could also develop the idea of the materiality of waste as racial and explore other methods to challenge practices of othering and spatial injustice. Future research could also address practices of othering in relation to gender, and analyse other unbuilt SAAL projects to investigate potential injustices. In addition, it could focus on the toxic biographies of other cities. Future research could expand on the 'aesthetics of otherness' and map different public art projects that challenge spatial injustice, or where waste has been explored as a resource, and case studies could be developed to study best practices and methodological approaches; this could lead to new production methods and collaborations between practitioners, industry, and academia. An in-depth analysis of the role of the artist in urban space and the study of other possibilities to reimagine waste-value, spatial justice, and sustainability could also be usefully explored in further research. Future research could also investigate different practices in urban space that share the values of this research

[509] Brown, (2017) *Emergent Strategy,* p. 5.
[510] Soja, *Seeking Spatial Justice.*

(spatial and material reconstitution) and advance new policies that support the integration of recycled / reused / repurposed materials in urban settings.

The thesis contributes to knowledge in the field by proposing waste as a resource with the potential to advance spatial justice. I have focused on the creative destruction of neoliberal capitalism, the 'ruins of modernity',[511] and the colonial production of the 'other' to propose 'otherness as a creative framework' to challenge spatial injustice and a linear perception of waste-value and to reinterpret the subversive potential of waste (Edensor) as a valuable resource for urban transformation. I have proposed the materiality of waste as racial to acknowledge that our perception of waste is shaped by practices of othering and wasting practices that discard certain people and certain places.[512] The thesis contributes to knowledge by introducing a new way of thinking about traces of 'otherness' left by waste and wasting practices in the urban space that account for the temporality of the city's archaeological layers. I argue that these traces should be recognised as a heritage value, and I have proposed the term 'places of disposal' as a contribution to the field by adding it to Guttormsen's four heterotopic features in order to read deep time embedded in the city.

I suggest that entropy can be a creative force and have reimagined waste-value in urban settings. Through practice, I have proposed alternative futures in which waste is reused, recycled, repurposed, and valued as a resource to advance material and spatial reconstitution. I have reimagined the role of the artist in urban planning and demonstrated the capacity of waste to testify to past events and challenge historical truths and spatial injustices and I have suggested the need for new public art policies that challenge spatial injustices and contribute to creating a more sustainable way of living together.

[511] Julia Hell and Andreas Schönle, *Ruins of Modernity* (Duke University Press, 2010).
[512] Armiero, *Wasteocene,*, p. 9-10.

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