Cities of the Future: Introducing Cultural Dimensions to Urban Sustainability Research

Lauren Verheijen

Leiden University

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by

Lauren Verheijen
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Supervisor: Prof. dr. ing. R. Zwijnenberg

Second Reader: Prof. dr. C. J. M. Zijlmans

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Introduction

Human life in the twenty-first century is difficult to characterise as anything less than complex, highlighted by ever increasing themes such as globalisation and the intertwinement between human groups, as well as between humans and technology. This complexity very noticeably manifests itself in urban life in the contemporary city. In 2018, UN estimations stated that over half of the human population, approximately 55.3%, resided in cities. By 2030, this number is expected to increase to 60%, with cities increasing in both size and number (UN, 2018).

Alongside this growth, the UN has declared it essential that humanity focuses on *sustainable* development, articulated accessibly through the Sustainable Development Goals (SDGs). These goals are intended to inform and question aspects of human activity until 2030 and set guidelines for future human activity within the parameters of sustainable ideals. Within the sustainability framework, the concept is presented as the connection between the different facets of human life on Earth and focuses on the prosperity of both humanity and the planet, now and well into the future. Furthermore, the framework outlines that no sustainability issue can or should be addressed independently of the others, in an effort to account for the complexity of contemporary life to some degree.

A four-pillared framework to address the multiple dimensions of sustainability was developed at the Development Congress in Johannesburg (2002); the four pillars being: social, cultural, economic and environmental. This framework posits that although the origins of sustainable development lie in ecological concerns, the social and institutional are likewise important (Soini & Birkeland, 2014). However, while much attention has been invested in the analysis of cultural traditions and heritage in cultural research, while contemporary art history and culture studies work to contextualize today's cultural and artistic manifestations; understanding of culture and urban life is largely underdeveloped, particularly in how humans should behave and perceive their surroundings in the context of sustainable development.

The topic of urban life has also been addressed in research in different fields, for example: human geography exemplifying the spatial arrangement of diverging cultural and demographic groups, industrial ecology analysing the flow of materials and energy through the physical infrastructures of the city, and urban planning experimenting with structuring the city to achieve certain ways of life. Independent attempts to address twentieth-century life in the city through artistic and literary exploration such as the experimental works of George Perec and

Situationist International's focus on psychogeography. Even earlier accounts on urban life include the poems about Paris by Charles Baudelaire. However, few to no attempts have been made at connecting the artistic expressions of urban life with the scientific research on cites. As such, the goal of this thesis is to explore this connection between the human dimensions, and the culture of urban life with the spatial dimension of the city.

Research on sustainability in cities tells a similarly fragmented story; urban sustainability has primarily been addressed from the perspective of urban planning, focusing on infrastructural and technological issues in conflict with the concept of sustainability. In line with the SDGs, questions on the future development of cities should include the notion of sustainability. As such, the question of culture in contemporary cities must also include the same notion. It is this sustainability element, or desire to work towards it, that frames the exploration of urban cultures in this thesis. This thesis, however, does not attempt to prescribe what a sustainability culture should manifest as, but instead explores a culture of urban sustainability as the relationality between humans and their environment.

The aim of this thesis is to conduct an exploratory case study into urban sustainability by using festivals as proxies for sustainable cities. The topic of urban sustainability cultures will be addressed by the festival, as a breeding ground of culture and creativity, to a city as a 'microcosm' through the theory of urban experimentation. Using two festivals that incorporate sustainable practices – *DGTL Amsterdam* (2018), hereafter *DGTL*, and *Burning Man* (2018)[1] – as case studies I can explore the manifestation of 'sustainability' as a set of values through the artworks presented on the terrain and the framing of the festival experience. *DGTL* and *Burning Man* were chosen for their distinctly contrasting characteristics with regards to location, organisational ambitions and themes, manner of structuring visitor experience and function of artists and artworks. Both festivals place sustainability, or the constructive relationship between humans and their environment, as a central element of the festival concept and design. The overarching theoretical claim made here is that addressing sustainability in cities cannot be done without incorporating the human dimension. This can be evaluated through the framing of culture and creative expressions. Latour's theory of the collective is a tool to underline this theoretical exploration, whilst urban experimentation acts as a lens to

[1] To make a distinction between the festival and the organisation, the festivals will be referred to in italic and the respective organisations in standard font. Other editions of each festival than in 2018 are indicated by the corresponding year.

understand the city through the festival. The function of this thesis is to test Latour's framework of political ecology in practise.

Structure of the Thesis

The first three chapters present layered literature reviews on the different angles to addressing urban sustainability. Chapter one outlines sustainability from the perspective of urban studies, while definitions of the 'urban' and 'urban sustainability' are offered alongside a mapping of the state of research. This chapter frames the discourses about the city for the context and boundaries of this research paper, whilst exploring avenues within urban studies research that provide an opportunity for development of new lines of thought on the sustainability front.

Chapter two questions why humans have a responsibility to develop a culture of sustainability by addressing the 'Anthropocene' notion. The 'Anthropocene' can be understood either from a geological perspective or a framing of the relationship between Earth and humans. To add a layer of complexity, the term 'Anthropocene' is contested within the scientific community which makes it difficult to justify and explain how humans take agency in this era. The function of this chapter is to disentangle this notion and explore the human socio-cultural dimensions of change and agency in the Anthropocene.

Chapter three links the topics of chapter one and two together by building a conceptual framework to address the relationships between humans, nature and technology. establish this conceptual framework by exploring the fields of ecocriticism, ecology and environmentalism; first presenting a historical overview of the emergence of these fields and how the philosophy has developed. Second, by using primarily the works of political-ecological philosopher Bruno Latour (2004) and philosopher Timothy Morton (2007), I formulate the conceptual framework to address the case study analysis in chapters four and five.

The final chapters of this thesis use the theoretical exploration and conceptual framework built in the first three chapters to conduct a comparative case study analysis into two festivals – *DGTL* and *Burning Man*. In chapter four I construct the methodology for analysing the case studies by presenting the remaining questions of political ecology to understand them in practice. The festival as object of inquiry is furthermore justified in its relation to urban planning through the notion urban experimentation, likening the festival to a microcosm of the city. Chapter five applies the questions to the two case studies to inquire about the role of political ecology in practise, and what might be learnt from analysing the festival experience for developing urban sustainability cultures.

Chapter One:
Urban Sustainability

As aforementioned, the city is a place called ‘home’ for a significant portion of the human population. Relationships between humans and the city have been turbulent in recent centuries, and even before that, foreshadowed by even early city narratives like that of Babylon. Just as some homes have seen their rooftops evolve from thatched to copper, the city has had to adapt consistently to the needs and changing tastes of the human. Less often examined, the human in turn has had to adapt to the demands of the city. The goal of this chapter is to gain an overview of this relationship within the context of the current environmental sustainability demand. This demand is unique as it is one that is extrinsic to the city and calls for a response from both humans and cities. To develop this understanding, the chapter first outlines an overview of the definitions of the city, the urban, and the relationship with its population. Furthermore, it explores the notion of urban sustainability and how change in this direction can be governed. I specifically delve deeper into the notions of urban experimentalism as a strategy for development, and urban ecology and metabolism as analytic and design tools for sustainability. These particular sub themes were chosen due to their interdisciplinary nature and plurality in theoretical strategies, thus providing an opportunity to interject new concepts and theoretical tools. Furthermore, the lack of cohesion under the theme of urban sustainability provides room to experiment with different models and practises for the conceptualisation of potential futures in the sustainable metabolic city. The chapter ends with a reflection on the prospects of a sustainable urban culture and the role design and art might play.

The Urban

With the centrality of the city to our lives, several angles and fields of research have been opened up to understand the contingencies upon which the city functions and even more simply, to define its essence. Geographically, the city is defined as: “a large settlement with a high population density” (National Geographic Society, 2011), whilst the urban area is understood as a “developed, densely populated area where most inhabitants have non-agricultural jobs” (National Geographic Society, 2011). Both these definitions give a vague sense of the constitution of a city, leaving out distinguishing themes other than residential density and non-agricultural practices. To effectively comprehend the nature of the city, all of its different aspects must be explored. There must be an understanding of the spatial city as an agglomeration of function-specific objects, as a system which binds the objects together in

space, and the relationship between the people and the urban space as their physical environment. It is these three functions that I will explore from the standpoints of urban planning and sociology to weave a more cohesive understanding of the city and its role in our society.

The city as space is one that is described as urban (National Geographic Society, 2011). Sustainability researchers Kennedy et al. (2010) describe the roles of the city for humans as a place to nourish and recover, to clean, to reside and work, to transport and hold a community. A spatial analysis often includes the recognition of certain objects such as residential housing and services, commercial spaces and some form of transport infrastructure, all in close vicinity to one another to support the high population density. This is the first function of the city. However, just the agglomeration of certain objects is not enough to understand the function of the city. The relationship between the objects, their codified spatial arrangement within the network of the city is equally important to understand, as I will develop in the second function. The spatial city is only a small contribution to conceptualising the city today, although it was a predominant discourse in earlier economic models, such as the zoning model by Burgess[2]. It was only in the 1960s that urban theorists started exploring the internal structure of a city and the population it holds. Following attempts at analysis, such as that of social geographer Henry Lefebvre, stated that urban development was the result of a socio-economic construct, namely that of 'consumption'. The evolution of such theoretical models is rationalised by the four-phase development structure of urban growth, which underpins that the city's construction is representative of its function. The first phase of this model identifies the materialisation of the city through a basic framework. In the second, the basic infrastructure of the city has formed so the intensity of materialisation decreases while resource consumption does not. In the third phase, the city densifies whilst materialisation decreases further. Additionally, material and resource flows stabilise. Fourthly, the structural transition in socio-metabolism takes place in which the social economy is fully realised (Ferrão & Fernandez, 2013). This model indicates the shortcomings of a spatial analysis of a city that disregards the social dimensions of the city.

The second function emphasises the city as a system, binding the objects together in space. In analysing the city as a system, it becomes clear that it is a physical network with certain objects,

[2] The Burgess model is a concentric zone model that divides the city according to primary function of the buildings contained in that zone. The most central zone is the 'Central Business District', characterised by a high density of commercial operations and low to no residential buildings. This transitioned into business and light manufacturing, followed by working-class residences/middle-class residences and finally suburban areas. This model was rarely found in practise (McDonald and Patterson, 2007).

goods and resources flowing through it. Understanding this network also builds a basis for analysing the interaction between the city and human behaviour, giving insight in to the creation and adaptation of the city alongside the evolution of human culture. This notion implies that cities take different forms should the society within which it is constructed has different values and governmental structures that inform the urban planning models, whilst also hinting towards the idea that the city in turn shapes the evolution of human culture. Anthropologist and geographer Harvey (2012) identified the history of the city as synonymous with the rise of capitalism, where the function of the city was to absorb the capital surplus created by the economic system. Because of this structure, the city and urban life have become characterised by consumerism and commodity culture. It is for this reason that in the early zoning models, such as Burgess', consumerism and retail were key features in the city. Simultaneously, this demands that a great deal of resources flow in, through, and out of the network – ranging from goods to energy, water, capital, and waste. Until recently, the city was understood as a linear system where resources flowed in for production and consumption while waste flowed out. This understanding is now being challenged within urban sustainability, as I will expand upon in the section on urban ecology and metabolism (page 12).

The relationship between humans and the city as their spatial environment is the third function, and perhaps the most important one. Human behaviour has shaped the city, and in turn the city has begun to shape humans. Harvey (2012) exemplifies this dialectic relationship by stating that "if the city is the world which man created, it is the world in which he is henceforth condemned to live. Thus, indirectly … in making the city man has remade himself" (p. 4). The additional point made here in this quote is that the future of the human is now dependent on the city, that there will be no return from urbanisation but only a development of the forms of the city for the future of human society. This should, however, not necessarily be interpreted pessimistically. Although Harvey outlines that contradictory notions of development, such as that of urban creative destruction, are the result of the rise of cities as fundamentally necessary to absorbing the supresses of a capitalist structure, Harvey also emphasises the need to develop systemic critique as a means to recognise "the freedom to make and remake ourselves and our cities … [as] our human rights" (Harvey, 2012, p. 4). In this way, the possibilities of urban alternatives must be developed out of the actualisation of critique on the current structures and with an emphasis on this relationship between humans and the city as a system.

This dialectical relationship between the human and the city previously outlined is a particularly interesting notion in the proposed geological epoch of the Anthropocene (a notion

I expand on in chapter two) where the concepts nature and culture, and the relationship between human and environment is being revisited as a result of the perceived wide-reaching impact of human activity on the planet. In this time, it is thus pertinent to play in to the right to remake our cities and envision alternative urban forms. There are two aspects to this – the first is the relationship between the human and his environment, the second is creation of an optimal urban form. The first relationship is critical in that "humans have become estranged from the natural conditions of their existence" (Broto et al., 2012). This has resulted in the increase in migration from rural to urban because of the diminished interaction between humans and Earth. The irony is that this is caused by the creation of the optimal urban form where provisions are abundant, such that the city we live in becomes our entire world of existence (Harvey, 2012). An attempt to break the current socio-economic mode indicates a change in behaviour, but urban planning researcher Jabareen (2006) suggests that this is inextricably related to the design of the built form. Optimization is only relevant in relation to a specific goal, towards the creation of an ideal city or a certain city function, and so the built form should be adapted accordingly. For the question of whether behaviour should follow form or vice versa we can return to Harvey's proposition that the freedom to remake our cities is our most neglected human right. Planning, designing and constructing a city is in this way a matter of agency; in the age of the Anthropocene it can be seen as an agency towards sustainability.

Urban Sustainability

Sustainability is a term that describes a positive relationship between the present and the future by exemplifying a certain desire to be forward looking in current practises and ideas. Urban sustainability is thus the notion of constructing cities that create optimal living conditions for the present community that the urban space holds, whilst allowing for future users of the urban space to have the same opportunities. The concept of sustainability is more commonly discussed in public discourse in relation to the use of natural energy sources and the impact this has on Earth. To focus then on the city as the human 'world', "sustainability is dependent on the way we collectively organise ourselves in growing urban centers" (Ferrão & Fernandez, 2013, p. 2), whether that is geared towards environmental or social sustainability. Urban planning has always been believed to be finding the optimal solutions in its contemporaneity. This practise is based on the solutions necessary for the time in relation to the technological and cultural developments of society. For example, according to urban planners Hajer & Dasser (2014), twentieth century architectural practise was aimed at the construction of the functional city. In the early 1950's, the appearance of cars led to space-time compression and thus the

consequential expansion of urban space as proximity was redefined. This led to the practise of regional planning taking the lead over urban planning as the size of spatial analysis enlarged, and the practise of zoning took center-stage. The functionality of the city was contingent on the technology determining a prevailing change over society at the time. With the increased focus on energy and resource consumption, proximity again was redefined in relation to the travelling distance taken up in cars. Twenty-first century urban planning can be characterised by planning for sustainability; it may be defined through its reflection on the failures of past urban planning in its orientation toward the possibilities of the future (Hajer & Dassen, 2014).

Urban planning for sustainability is however not a coherent field. Research is incomplete, and the field is characterised by methodological pluralism (Kennedy et al, 2010), making it difficult to establish feasible plans for urban development. Firstly, the field is split into two ideological approaches towards the relationship between humans and the biophysical realm; (1) the human exemptionalist paradigm (HEP) and (2) the new ecological paradigm (NEP) (McDonald & Patterson, 2007). The first calls for an anthropocentric point of view and believes that by focusing on the way in which human communities are organised can explain the spatial arrangement of cities. HEP believes that humans are exempt from ecological constraints and any challenge can be overcome by technology and the adjustment of the economic system. Contrarily, NEP rejects these ideas and highlights the constraints of ecology on human behaviour in addition to the need for interdisciplinary research. This paradigm argues that the city should be viewed as an ecosystem, thus taking into account the flow of materials (e.g. building construction, food, resources) throughout the city. This analogy has been adopted by several urban sustainability theorists under the umbrella term ‘urban metabolism’. Yet, NEP ignores the social factors that may also have a limitation on the functioning of society and does not recognise the inconsistency between the positive feedback process of urban ecosystems in contrast to the cyclical metabolic demands of natural ecosystems.

Furthermore, the city is now increasingly understood in the sense of interconnectivity, systems-thinking, and integration in contrast to the key features of modernist planning and fragmented zoning models that have traditionally characterised the city. One proposal is to understand the city in terms of its energy flows, similar to the NEP model. Ferrão & Fernandez (2013), architect and engineer, respectively, propose that we are currently approaching the fourth phase of urban growth, the phase characterised by the transition to sociometabolism in which the social economy is fully realised, requiring a structural shift from the current mode of production. This builds on the notion that cities are sites of resource consumption and waste

production, as was established in the capitalist function of the city. However, this presents the city as a linear reactor instead of being analysed as the highly complex anthropogenic systems it has become (Ferrão & Fernandez, 2013). Secondly, Ellin proposes an integral urbanism, which would "instead provide urban reinforcement or "redirection", allowing the growth of a dynamic and polycentric and networked city rather than an artificially imposed and bounded mono-centric city" (2013, p. 67). A third proposal is that of the 'smart city' (Hajer & Dassen, 2014), which describes the shift towards a sustainable city by intervening in the structure of cities by bottom-up planning in which urban metabolism and technological efficiency lie at the core. All of these proposals suggest a shift in urban analysis towards thinking about non-linear resource networks and emphasising greater complexity, synonymous with thinking in terms of the city as an ecosystem. The task of conducting research, analysis and comparison of sustainable cities however remains difficult in the multiplicity of theoretical approaches.

A response to the incoherence of the analytic structures mentioned so far in the field of sustainability is that of the 'experimental city' (Evans et al., 2106). Experimental approaches are particularly useful in that they allow for learning from practise in microcosms. The experimental city as such expands on the conditions of a bottom-up approach to planning by proposing interventions in a city that can then be upscaled if successful. Alternatively, experimentation as innovative model within the city can become the basis of a governance model for developing the city. Social scientists Sengers et al. define an experiment as "an inclusive, practise-based and challenge-led initiative designed to promote system innovation through social learning under conditions of deep uncertainty and ambiguity" (2016, p. 26). Experimentation may be framed in different ways, focusing on the civic engagement of local communities, emphasis on the practical learning strategy, or as a base for innovation. On the one hand, these experimentations open new avenues for exploration within the city. They are difficult to govern and resist the city-wide definition of a sustainable city and its potential analysis. On the other hand, experiments are highly contextualised, responding to local, cultural and ecological contexts and thus present great opportunities for testing new models of sustainability by being practise-based interventions. Thus, where innovation is difficult to implement through governance due to high risk factors, experimental initiatives offer a much lower threshold. In chapter four I will expand on this urban model as part of an analytic framework to analyse the case study.

Urban Ecology and Metabolism

Conceiving of the city as an organism or an ecosystem proposes unique tools for the creation and adaptation of the sustainable city. The nature of the ecological science is that it addresses both individual and groups of organisms, but also landscapes and ecosystems as individual units (Pickett et al., 2013). Ecology as a principle of analysis can thus be easily applicable to the city as a specific unit, were it to then be considered as an 'urban ecosystem'. However, the danger in this approach is that by applying ecology to the urban as a metaphor, the analysis may remain superficial, in contrast to analysing the urban as an ecological entity. As a metaphor, the application of ecology may be only superficial but is still useful in allowing for comparisons to be made between the bioecological processes of urban systems and the resilient and sustainable processes found in natural ecosystems. That said, the application of the ecological principles to the urban allows for an alternative analysis to the state of research in urban planning. Furthermore, the distinction between ecology in the city and ecology of the city are equally differing in their analysis of the city; whereas the first refers to the presence of (natural) ecology in the city such as a public park, the second refers again to the city as ecosystem. In the second case, metabolism again takes center stage and allows the city to be analysed in a network of interactions and structures (Ellin, 2013). These scenarios all indicate a design practise of integral urbanism, which highlights the potential of designing urban space by adhering to factors other than those typically urban. Kennedy et al. (2010) highlight this potential by emphasising that if cities were to be conceived of as having traits more reflective of ecosystems, they would immediately be more sustainable.

The use of a material flow analysis (MFA) is one way in which the notion of urban metabolism, or urban ecosystem, may be developed as an analytical tool to inform designers on the efficiency of the system, allowing for an integrated approach towards sustainable cities. The MFA highlights the material and energy flows through a city, allowing for the optimization of the 'metabolism' through identifying a waste output as an input for another industry (Broto et al., 2012). In this way, urban planners are able to do away with the linear conception of the city where resources flow in and waste flows out by re-defining waste as a resource that provides an understanding of the city through a series of systems and feedback loops. This hints not only towards a coherent analysis of cities through the emphasis on flows and interaction, but also to the necessity of identifying the city's complexity. Additionally, the MFA reflects an ecosystem analysis as in both cases the boundaries for data collection must be clearly defined. Furthermore, this notion shifts away from the idealisation of ever-increasing economic growth,

given the realisation that capital accumulation is not environmentally sustainable in this way. Here we return also to the necessity of design principles encouraging a change in human behaviours, away from that within the current socio-economic model, so away from the consumerist culture.

Still, the overarching question remains regarding what the role of design is in an issue where scientific analysis paves the way for analysis and intervention. The nature of the problem of sustainability is complex for designers as it cannot yet be attributed to a set of design principles and aesthetics other than the translation of the principles of ecology. Jabareen (2006) proposes seven design elements that are intrinsic to the sustainable city, yet also emphasises that the 'eco-city' presented remains a proposal focused on management rather than form. Other attempts remain along the lines of giving cities 'natural traits' (Kennedy et al., 2010), yet still fall short of defining such traits aesthetically. The most conducive proposal might be that of the landscape as method and medium for design. This proposal is rooted in the idea that rural landscapes have traditionally been formed by human experience and so can be extended to the urban. Rather than focusing on the ecological workings of the landscape as a unit, the landscape is here defined to function in the perceptive realm and design may be defined as an intentional landscape change (Iverson Nassauer, 2013). A general understanding of the aesthetics of a sustainable city remains nuanced, instead indicating that the design for cities is a case of 'form follows function'. The design of a sustainable city is dependent on the resource availability and the function of every building in the resource network defined and analysed under the principle of urban metabolism.

Towards a Sustainability Culture

To return to the point about the inextricable relationship between man and the city, in their behaviour and form respectively, the development of a sustainable city cannot come without the development of a sustainability culture. The step towards considering the sustainable culture has been taken since the development of socio-economic analytic approaches of the city, however the environmental aspect remains only a secondary concern. Hajer & Dassen (2014) exemplify this point through the analogy that the issue of clean water is considered often only in relation to health and not to the environmental and ecological consequences of polluted water. In the interdisciplinary nature of sustainability, both socio-economic and environmental components must be considered in tandem in order to create a coherent understanding of the issue and to generate solutions. The proposal by Broto et al. that "knowledge of metabolic

inflows and outflows should be linked to how particular things, such as urban forms, lifestyles, and infrastructural landscapes, lead to metabolic differences" (Broto et al., 2012, p. 854) suggests the link between urban metabolism as analytical tool and a sociological and behavioural analysis.

The role of design is to build a bridge between the scientific and the cultural, where "artists can shape a new aesthetic that combines a visual sense of place, a willingness to physically 'sculpt' living matter, an engagement in public life" (Wilson, 2002, p. 130). The notion of the experimental city is here particularly constructive in creating nodes in which new forms of urban life can take form. While architectural and urban design still has to work in accordance with the structural necessity of the urban space, artists have the freedom to create opportunities and radical approaches for sustainability in the city that may in the first instance appear as practically unfeasible solutions. In this way, a new culture or a re-living of the city through different practises can allow us to build new forms of the city that are sustainable. This two-sided relationship between urban form and urban culture as such has provided a unique space for interjection into the current mode of production and consumption that builds and sustains the city.

Chapter Two:
Living in the Anthropocene

The role of human activity is a central aspect to the climate change debate and in defining the contemporary planetary environmental crisis. One attempt to characterise this debate is to coin the current geological epoch the 'Anthropocene'; this is to say that the current geological era is defined by human activity. The term 'Anthropocene' was proposed in the twentieth century by climate scientists to encompass the extent of impact on Earth by humans. In the twenty-first century the term's discussion has expanded to include the problem of responsibility. Human activity is now discussed considering how our actions may have led us to the contemporary planetary crisis, what actions should be taken to avoid further intensifying the crisis, and what human activity should look like in the future.

Discussing the social aspects of changes in the climate and nature, whether caused by humans or natural forces, leads us to a greater consciousness about the relationship between humans and the planet we inhabit. I opened chapter one by highlighting that to all humans, Earth is a placed called 'home'; but what does this mean to us? More specifically, what does the relationship between humans and the Earth mean under the 'Anthropocene' as a contested term? This chapter seeks to answer this by identifying the human socio-cultural dimension of change and response to crisis through the concept of agency. Agency is a core concept of this chapter as it allows us to build a bridge between the past that influences today and future that is designed by us. Here I will also discuss the relevance of the city as a characteristic of Anthropocene life. I will determine this agency for humans through first outlining the term 'Anthropocene' as the condition that we are in now. Secondly, I will delve into the past, dissecting the debate on the causes of the Anthropocene and the Capitalocene critique. Lastly, I will turn the gaze to the future by discussing the perspectives on sustainability and how agency may be translated into a sustainability culture in urban life.

The Age of the Anthropocene

There is no denying that humans currently live on a planet with a surface that has been altered by many years of human activity, showcased by the giant structures that form our cities to the plains that are the basis of the agricultural industry. Landscapes are diverse, and they are not all natural. In fact, very few remote places remain untouched by human hands. Beyond the seeing eye, the ephemeral composition of greenhouse gases (GHG) in the air present another

dimension of modification to the Earth. Considering these changes, a proposal has been made that we have exited the Holocene and are now living in the geological epoch coined the 'Anthropocene'. Initially, the Anthropocene proposal was one made by climate scientists of the Anthropocene Working Group (AWG) of climate scientists, who sought out to measure the extent of the impact on Earth and its natural systems. Such 'Earth Systems' refer to the understanding of the interaction between the different spheres – for example the atmosphere (the collection of gases surrounding the planet), hydrosphere (the combined water found on, under or above the surface of the planet), and biosphere (the sum of ecosystems found on the planet). Earth Systems analysis has allowed for the representation of the intricate working of the elements on planet Earth, with one of the more recent additions being human activity. The Anthropocene proposal is thus one that is originally based in the natural sciences, however, was quickly adopted by researchers in the humanities and social sciences to bring in the importance of politics, economics and human behaviour as a cultural facet and not only measurable in terms of inputs and outputs. Very quickly the proposal has become multifaceted and complex in its existence. In this section of the chapter I focus on the original proposal by Paul Crutzen – atmospheric chemist and member of the Anthropocene Working Group – and colleagues to introduce the concept of the Anthropocene, retaining the political and historical debate for the second section. I will conclude this section with the characterisation of life in the Anthropocene as ambiguous and uncertain.

Crutzen and colleagues initially presented the term 'Anthropocene' as a geological time scale, suggesting that "the concept of the Anthropocene to denote the current interval of time on Earth in which many key processes are dominated by human influence" (Zalasiewicz et al., 2011, p. 835). According to Steffen et al. (2007), this proposal suggests that human activity rivals the dimensions of forces of nature, acknowledging that the social and biological evolution of humans and societies from hunter-gatherers to modern, technology driven-humans, has become a 'global geophysical force'. This suggestion has not been taken lightly nor without contestation. Geologists have not yet accepted the term as a true marker of an epoch, debating whether the geological characteristics of the Anthropocene have truly been great enough to mirror the intensity of changes between previous epochs. To answer this geological debate, dating the onset of the epoch must also be decided upon. What makes this dating unique is that this it is the first suggested distinction between epochs during which the conscious definer is alive – the humans; in all epochs before the Holocene there was no human, and all were defined in retrospect. This leaves us with a tricky matter as the implications span far beyond an addition

to the geological timeline; excessive formalization will lead to a hindrance in research possibilities, whilst under-formalization diminishes the possibility of creating a cohesive field of research.

A popular suggestion to mark the first state of the Anthropocene is the Industrial Era (ca. 1800-1945) as the moment in which human activity surpassed the energy bottleneck that had until then limited the further development of human society in terms of population numbers, the global economy, and the ability for humans to shape the biosphere to their needs (Steffen et al., 2007). This bottleneck was shattered by the widespread use of fossil fuels in line with the introduction of technologies which greatly improved human efficiency, such as the steam engine. Humans gained the ability to domesticate more of the planet's surface, construct buildings and infrastructure at greater speeds, and develop the global economy towards an ever more connected and efficient system. Geologists find consensus in this proposal because it is the phase of human existence during which airborne CO_2 levels surpassed the highest fluctuations in the Holocene. Since that moment, human life and its structures have become increasingly intertwined with technology, all of which continues to develop at unprecedented speeds and in innumerable directions. This unprecedented development characterises stage two of the Anthropocene – 'The Great Acceleration'. Steffen et al. (2011) state that since the industrial revolution new social and political structures coinciding with innovative thinking and an updated economic order with market emphasis have evolved. Through this socio-political rearrangement, human society fundamentally changed the way it interacts with Earth Systems. As such, living in the Anthropocene is defined by a socio-political order that characterises the age of man since the Industrial Revolution. The contemporary context lies in the third stage of the Anthropocene, which Steffen et al. (2007) distinguish as the intertwinement between the human as global agent and decision-maker. In the contemporary world, all human activity has an impact beyond the local context in which it is placed. However, the uniqueness of this stems from the fact that humans also have an awareness of this; we have become conscious actors and a highly interconnected global system.

In outlining the three stages of the Anthropocene as proposed by the climate scientists, I briefly mentioned the updated socio-political order which characterises contemporary life. Key attributes of this are an increased focus on economic order, market emphasis, intertwinement between technology and global interconnectivity. To give context, the relevance of the city in this context must be reiterated. In chapter one, the city was depicted as a heavily interconnected spatial arrangement of function-specific objects with a human population at a large density.

Lefebvre states that urban development was a result of a specific socio-economic construct; the same construct which demanded an increase in efficiency and focused on economic growth and market structures. Similarly, I quoted Harvey (2012) in the synonymy between the history of capitalism and the rise of the city. In defining the city in this way, parallels begin to form between the establishment of the city and the Anthropocene. Furthermore, the city is a system, absorbing resources that are transferred between objects and capital that is transferred to and between humans. The notion of systems thinking is what gave birth to urban metabolism as an analytical proposal. Place this notion again in parallel with the importance of systems thinking in establishing the Anthropocene as epoch and it becomes clear that the development of the concept Anthropocene could only have emerged simultaneously. Several authors additionally and explicitly mention the growth of cities as a key feature of the Anthropocene as a manner of structuring the rapidly increasing population and technological development (Zalasiewicz et al., 2011; Steffen et al., 2007; Steffen et al., 2011; Moore, 2017). It thus becomes vehemently clear that understanding the development of human culture is inextricably linked to understanding the role of humans on and relationship with the Earth in the age of the 'Anthropocene'.

This brings me to defining the key characteristic of the Anthropocene – that of uncertainty. Based only on the current complexities of finding any sort of consensus within the concept of 'Anthropocene' it can be established that the future is largely ambiguous, and decisions are highly consequential. Since the term has moved towards the social sciences and humanities, where not only the quantifiable impact of human activity is measured but principally also the role of humanity and its relationship to Earth is considered, the complexity of the debate has only increased and become more political. Another discussion that follows this trend is that of human evolution. Glikson (2014) argues that the development of tools and technologies should be emphasised, originating in the mastery of fire. This presents an argument in which human evolution started following a separate path from natural evolution from the moment humans developed tools, namely a cultural path. Cultural evolution is highly unpredictable in that there is no established model that will guide us to the future. Historian Dipesh Chakrabarty takes on a perspective that further entangles evolution, culture and the uncertain situation within which we find ourselves today:

> "Humankind ascended to the top [of the food chain] so quickly that the ecosystem was not given time to adjust. Moreover, humans themselves failed to adjust. Most top predators of the planet are majestic creators. Millions of years of domination

> have filled them with self-confidence. Sapiens by contrast is more like a banana republic dictator. Having so recently been one of the underdogs of the savannah, we are full of fears and anxieties over our position" (Chakrabarty, 2017, p. 33)

This quote presents the mismatch between biological systems (evolution) and human systems (societal growth), and the resulting situation characterised by uncertainty. Similarly, this disparate development may form as a basis for the nature-culture dichotomy held by humans today, which I will explore further in chapter three. Solving this precarious situation requires an understanding of the measurable impacts of human activity but also the socio-political and cultural structures that continue to shape human existence. It for this reason that anthropologists Braje & Erlandson advocate for the term 'Anthropocene' as heuristic device, proposing that the "Anthropocene should help focus attention on better understanding the deep, complex and ongoing history of human impacts on local, regional, and global scales" (2013, p. 120).

The Anthropocene may be more of a warning signal for the need to revaluate the cultural, socio-technical and political aspects of human life than a geological marker of time. Environmental researchers Berzonsky & Moser (2017) propagate this assertion by introducing the idea that the next phase of human evolution may be cultural rather than biological, following a transformation that lies in the change of behaviour, practises, artefacts, institutions and underlying values – thus referring to a cultural and psychological evolution. In this way, the Anthropocene is a "call for society to move away from values that drive environmentally unsustainable in addition to economically and socially unjust trends to a new set of values supporting the emergence of true ecological, economic, and social sustainability" (Berzonsky & Moser, 2017, p. 15). As such, the emphasises on humans as a conscious geological force encourages agency in a cultural shift towards sustainability, as discussed by Chakrabarty.

Awareness and Agency

From the popularisation of the Anthropocene discussion it is clear that there is an awareness of the environmental impacts caused by human activity, if not in the general public it exists amongst scientists. The documentaries[3] that have been released in the first decades of the twenty-first century have attempted to transmit this knowledge to the public, although they have been received with ambivalence – just as the 'Anthropocene' has in the scientific community. In the last paragraphs of the previous section, the notion of agency came to light through the necessity to build a greater understanding of how the history of mankind continues

[3] *An Inconvenient Truth* (2006), *Before the Flood* (2016), *Home* (2009), to name a few.

to impact the natural environment. In this section I further develop the notion of agency as core to the development of a sustainability culture in cities. In order to do so I delve into the 'Capitalocene' argument presented by environmental historian Jason Moore, as a contribution to the Anthropocene debate that places more emphasis on the socio-political structures that allowed the current planetary condition to emerge. Moore's argument suggests that it is not the human – the Anthropos – as an undifferentiated species that is to blame for environmental change or degradation, but that it is rather the result of the Capitalist system. Central to the argument is the issue of blame and responsibility, highlighting that historical thinking must be central in coming to understand the planetary crisis in the twenty-first century. The Capitalocene is an attempt to fit together patterns of power, capital and nature through the previous centuries. One consequence that can already be seen is that not every human is affected equally by climate change due to their socio-economic and environmental factors. Capitalists are able to better protect themselves against the climate crisis due to their socio-economic position, by choosing a geographical position that may be less impacted and by creating the infrastructure they need in order to remain unaffected.

Moore contends that the socio-economic and political system we call Capitalism cannot be understood by referring to its history from the industrial revolution to the present. Rather, he argues that we should consider our history back to the era of colonialism to explain the rise of the current planetary condition. This, Moore argues, was the basis for the logics of isolation, fragmentation and simplification that shaped the monocultural landscapes of early capitalism, allowing humans to be evermore distanced from nature and natural processes; both on an ideological level between human and 'untouched' nature, and spatially in the appearance of urban spaces. Capitalism also placed an emphasis on efficiency in production and circulation of resources, resulting in the devaluation of nature as a 'cheap' resource, a value which persists to this day.

Capitalism provided the basis for separation between humans and nature; a distancing that according to the current debate on the Anthropocene, Capitalocene, etc. is calling to be undone. Although the Capitalocene and Anthropocene do not agree on all aspects, they argue for the revaluation of nature in the relationship between humans and nature. Both agree that the introduction of technology played a role, but only to the extent that it changed the socio-political structures of human society. Thus, to revaluate nature means to also redevelop our relationship with technology; another aspect to be dissected further in chapter three. While it is beyond the scope of this research to debate on the origins and causes on the environmental

impacts that characterise the Anthropocene, or to define the Anthropocene, I raise these debates to highlight that the relationship with the environment (natural or artificially built) is very much in the human consciousness. The agency to change our socio-political structures stems from the causation of the current planetary crisis, being that of human activity. Agency is not just a matter for those who are to blame (if we can even pinpoint the blame) for the issue at hand but lies in everyone to create a future for humankind.

Perspectives on Sustainability

The suggestion to create a 'sustainability culture' or promote values relating to 'sustainability' emerges from the premise that there is something inherently unsustainable in human activity so far. This statement may seem redundant, however, consider the desire to label a geological epoch as anthropocentric, or the deduction to blame a certain socio-political system – capitalism – for the outcomes of human activity as indicators for the search for an alternate future. Sustainability is the term that encompasses exactly this indication; it is the maintenance of human welfare in both the present and the future, which in turn must also take into consideration the welfare of the planet now and then. As such, redefining the relationship between humans and the Earth and distancing from the dualism of humans and nature is vital to creating a culture of sustainability.

Within the Anthropocene, debate researchers for 'Complex Systems in Transition', Preiser et al. (2017), establish four main discourses: eco-modernism, biosphere stewardship, sustainability paths, and critical post-humanism. All four perspectives tend towards a sustainability culture by slightly different strategies, using different facts of humanity as tools. 'Eco-modernism' argues that sustainability will come from continued human development through technological innovation and modernization. The 'planetary stewardship' perspective maintains that humans should maintain a relationship with awareness as part of and dependent on the biosphere. The solutions presented from this perspective are through governance systems. 'Pathways to sustainability' advocates for pluralities and emancipation of marginalised voices to generate alternative structures for a sustainable future. Lastly, 'critical post-humanism' suggests that humans do not have special agency, but that all elements in the Earth Systems have equal agency and should be considered equally. These four discourses represent the importance of framing the problem, as I have also tried to exemplify with the different arguments put forth in the Anthropocene debate. What remains central to these four discourses is the way the relationship between humans and nature is conceptualised and

mediated by technology and the socio-political structures. In chapter three, I will expand on the eco-modernist discourse as I expand on the relationship between humans, nature and technology.

The four perspectives are not entirely mutually exclusive and may also be characterised into two different approaches towards human-nature relationships: human-centered and planet-centered thinking (Chakrabarty, 2018). These may be considered synonymous to the HEP and NEP (respectively) as the split ideological approaches in urban planning. Human-centered thinking is inherently anthropocentric, rooted in the belief that human exceptionalism creates a "potential for planetary change [is] almost as great as that caused by the origin of life or the rise of oxygen" (Chakrabarty, 2018, p. 26). HEP similarly stated that humans are exempt from ecological constraint. Modernity and ideals of dualisms and differentiation are core to this human-centered approach. 'Eco-modernism' and the 'pathways to sustainability' perspectives fall into this category, both emphasising the value of socio-political structures and governance in overcoming the planetary crisis. Planet-centered thinking, in contrast, characterises itself by stating that humans have become stewards of Earth. Humans are no longer able to be an inconsequential exceptional force and must submit to becoming conscious of their embedment within the Earth Systems. NEP synonymously highlights the constraints of ecology on human behaviours. The second discourse presents a critique on modernist values by emphasising relationality and intertwinement between human and nature, thus seeking to disarm the dualism and one modernity brought about. The 'planetary stewardship' and 'critical post-humanism' perspectives can be characterised in this manner of thinking by emphasising the consideration of biological forces and elements in sustainability solutions.

Conclusion

The Anthropocene debate stemmed from a scientific discussion on the chemical make-up of our atmosphere, the relationship with human activity and how this may impact Earth and the future of human civilisation. Unlike within the process of defining the boundary at the start of the previous epoch, or the Holocene, we now find ourselves in a predicament where defining the boundary for the start of the Anthropocene has an influence on how humans curate the future. This complex conceptual web between human nature, human activity, geological definitions and biological nature makes it no longer possible to limit the approach to the hard sciences. Interdisciplinarity is the nature of the Anthropocene debate, as demonstrated the Capitalocene proposal and the relation of the science to politics and popular media. Similarly,

a purely technological response to the planetary crisis would be inadequate by ignoring the fact that humans are intertwined with the Earth Systems.

Sustainability is the concern for the future within the context of human welfare in the present. However, as the city becomes home to an increasing proportion of the worldwide population, it becomes harder to envision the intertwinement between humans and nature. The nature-culture dualism introduced by modernity is only strengthened by the artificial surroundings, whilst technology plays a greater role in human lives and welfare. Any sustainability culture must function within the contours of this human existence, encompassing all four aspects of human life: human, nature, technology, and the city. The socio-cultural dimension of this relationship is the agency for change, the desire for sustainability. Similarly, a sustainable city is one governed by the interaction of the four aspects. Having established the academic background on the notion of sustainability and its contemporary context (the Anthropocene) by building a bridge between the past and the future, I now turn to the conceptual boundaries of the terms human, nature and technology to establish a model in which the sustainability culture may take form.

Chapter Three:
Striving for a Collective

> *"Ecological issues are situated at a complex intersection of politics, economy, technology, and culture; envisioning them in their global implications requires an engagement with a variety of theoretical approaches to globalization … that focus on its cultural dimensions" (Heise, 2015, p. 173)*

The previous chapters have explored the context of this research, in terms of physical place – the urban – and academic background – the Anthropocene – in line with questions of sustainability. This third chapter aims to link the aforementioned topics through the conceptual framework that defines humans, nature and technology in relation to one another. The necessity of addressing this lies in the need to define the 'urban' within cultural theory, beyond its spatial analysis presented in chapter one, and seemingly in contrast to the notion of 'nature'. To build the base of this definition, the fields of ecocriticism, ecology and environmentalism will be addressed with the goal of working towards diminishing the dichotomy of nature and culture that to this day holds in our representation of the world. As such, I will first undertake a chronological exploration through the field of ecology, working from the first to the second wave of ecology and ultimately into a critique on the environmentalism movement specifically. The remaining section of this chapter explores the role of 'technology'. Here I will respond to ecology with the 'ecomodernist' movement, as proposed in the manifesto by members of the Breakthrough Institute (Asafu-Adjaye et al., 2015), a center for researching technological solutions to environmental and human development challenges. Although I will address multiple theorists of the ecocritical and ecology movement earlier in the chapter, my analysis will take form through a framework based on the works of political-ecological philosopher Bruno Latour, intersectional philosopher Timothy Morton and Ted Nordhaus & Michael Shellenberger, environmental policy experts and co-founders of the Breakthrough Institute. Technology has been a largely absent topic in this thesis so far, yet is essential to discuss due to its prominence in the contemporary human life. By concluding on the role of technology in relation to human and 'nature', I will have set the stage for addressing the urban in an ecological context and explore possibilities of redefining urban sustainable culture in the next chapter.

Ecology

The term ecology can be defined in the following ways: (1) the branch of biology that deals with the relations between organisms and to their environment, (2) the political movement concerned with the protection of the environment, a follow-up of the environmentalists. It is the second branch that is of most relevance here. Yet, what I am more specifically interested in is how the terms that influence ecology (such as nature and culture) are defined. To do so, I inquire about the field of ecocriticism, constructed by a group of literary theorists exploring the creation and definition of nature through (primarily English language) literary criticism. I have taken a few key texts from *Ecocriticism: the essential reader* (2015), a collection of essays which acts as an overarching resource presenting texts from primary theorists in the field. It will become clear in my argumentation that the second-wave ecocriticism ties in more closely with the goals of the research of this thesis; as such I have delved into the expanded personal works of Bruno Latour and Timothy Morton; both are also represented in the primary source on ecocriticism.

First-wave Ecocriticism

First-wave ecocriticism, with its beginnings in the 1970s, is characterised by attempts to understand the term 'nature' through analysis of implicit representations and references in literary texts. However, it can be argued that the attempt to understand nature as an idea has been evident since the time of Plato and other philosophers of antiquity, as will be seen in the political theory proposed by Latour. Coming to terms with 'nature' might be another way of describing how this contemporary group of literary theorists explore culture. One of the central ideas proposed by this movement is the notion of 'ecocentrism' in contrast to 'anthropocentrism', an ethic that makes human interests central. Literary and environmental theorist Ken Hiltner (2015) presents in the introduction to ecocriticism that ecocritical theorists understand the privilege of human concerns over others in this world as worrisome, and so suggested that the interests of all species should be considered equally. However, such a proposal is only relevant when considering the impact on nonhuman nature as unintentional consequences of human activity, as highlighted by the arguments of the Anthropocene presented in chapter two. Historian Lynn White Jr. (2015) places into perspective that the relationship between humans and nonhuman nature has been prevalent throughout human history, and the consequences in nature have always been visible. He argues that all forms of life modify their contexts, so that desire or need to incur change in the landscape is not a feature unique to humans. Still, the cultural shift towards awareness of the environmental

consequences is only recent. What is unique to humans is that the change is now so largely visible, but perhaps that is simply a matter of population scale and the need to share resources amongst large groups. Environmental activist Gary Snyder suggests that the sharing of a natural area may be better understood as the use of "common pool resources" and is simply a method of orienting territorial place and social contexts (Snyder, 2015, p. 73). In this way, nature is simply the resource that man uses to survive. Although, this is also the greatest critique on the economic valuation of nature by environmentalists.

The relationship between man and nature where nature is a resource for man's survival, is conditioned by the relationship popularised in the Middle Ages – man as master of nature in service of God (White Jr., 2015). Religion's prominence here also brings to light the introduction of a linear time frame for humans. Unlike ancient theology, Christianity introduced a creation story, presenting a 'beginning' for the visible world. With the mark of the 'beginning', true cyclicality is no longer possible, and so such time frames may be understood as the basis of the concept of development and progression so prominent in contemporary politics. Man's understanding of change as such is thus entirely different from that of ecology, which is rooted in circular thinking and mutual feedback (Shepard, 2015). This reference of linear thinking may be Occidental, but caution is given to buying into the idea that humans have at any time or in any place existed in harmony with nature - it is to be better understood that they were aware of nonhuman nature. To exemplify, consider the hypothesis that grasslands were created by the fire-drive method of hunting in the Pleistocene or deforestation to build ships by the Romans (White Jr., 2015). Against Darwinism, humans are not part of the 'natural process' but have developed culturally and shape their environment around these cultural needs. Similarly, Shepard contends that we do not have an ecology of man; we do not consider what we give back to nature, or even whether we have to give something back. Literary theorist Ursula Heise proposes that whereas understanding this relationship between humans and nature is devoid of systems thinking "ecology … seemed to be a science that dealt with harmony, a harmony found in nature, offering a model for a more organic, cooperative human community" (2015, p. 169). Understanding the context of humanity and its counterpart, nature, must return to the ideas of circularity so that every entity in the human and nonhuman world can be understood in relation to one another. Literary critic Buell (2015) suggests that our greatest obstacle is that the perception of objects is much easier when they are defined categories, thus we have a great capacity to represent individual entities.

Unfortunately, first-wave ecocriticism does not move beyond this discretion, limiting its findings to evolution of humans and nature alongside one another as separate objects.

The last commentary on the valuation of 'nature' to present here is 'nature' as the antithesis of the urban, which is how it is understood in the wilderness theory by environmental historian William Cronon. 'Nature' as such is a cultural construction that creates a 'wilderness' as a retreat from the urban, as a place of serenity that allows for an escape from our hectic contemporary environment (Cronon, 2015). The uniqueness of this proposal is in highlighting that when nonhuman nature was once our home we had this awareness of it that allowed us to co-create (whether resulting in intended or unintended consequences); in contrast, for the last few centuries an increasing number of humans have been living in this artificial construction called urban space, which resulted in such a far distancing from nature that we now yearn to return to it as a place of serenity. 'Homo urbanus' (to join the never-ending wordplay on the cultural evolution of homo sapiens) conceives of nature as a sublime, sacred, external entity of which we are no longer a part. Ironically, a return to this nature is what we desire most. In doing so, the appearance of environmentalist movements in line with first-wave ecocritical thought has constructed nature as an external entity we seek to protect but are no longer able to unite with culture in politics. Any ecological politics governing cities must thus work to undo this separation.

Second-wave Ecocriticism

The greatest limitation of first-wave ecocriticism is its inability to move beyond the established categorisation of objects. Here second-wave ecocritics jumped on the opportunity to turn against the conceptual dichotomies that modernity and science imposed, such as subject-object, body-environment, nature-culture. As Heise refers to it, second-wave ecocriticism is particularly critical of the "presumption to know the natural world scientifically, to manipulate it technologically and exploit it economically, and thereby ultimately to create a human sphere apart form it in a historical process that is usually labelled "progress"" (2015, p. 167). In her guide to ecocriticism, Heise furthermore explains how the introduction of socio-political critiques in relation to environmental issues, such as the recreational enjoyment of nature (building upon the notion of wilderness presented by Cronon), in ecocriticism created a shift towards the focus on urban spaces. Here some conflation begins to take place between the terms: nature, culture, human, urban and environment, all of which lie at the core of the attempt by these ecocritics to break down the dichotomies. It is not to say that these terms are not

relevant or in any way productive, but that the definitions should be reworked to allow politics to move forward with ecological thinking. Similarly, Morton (2007), whilst arguing for an 'ecology without nature', shows that monism – a form of representation where nature and humans are constituted as the same – may be as dangerous as the current state of dualisms, as we should not ignore that there is an irreducible otherness between nature and humans, or between nonhumans and humans. For this reason, Morton proposes that an ecology without nature is paradoxical, yet entirely necessary. Ecology without nature is here understood as an ecology within which the understanding of 'nature' emerges from representations enforced by the dualistic worldview of human/nature. This worldview does not emerge from speculation, which maintains a large distance between the two entities, but from an immediacy that reinforces the interaction between them.

Similarly, Latour discusses the place of 'nature' by informing a new organisation of politics in which humans and nonhumans become part of the same 'collective'. To clarify, for Latour the nonhuman is all that is 'not human', including all 'nature' as it was defined by the first-wave ecocritics in addition to every other object that does not fall into the category 'human'. This does away with the dichotomy of what is nature or culture, subject or object, natural or unnatural, by placing all things on the same plane. The primary source informing the argumentation here is Latour's book *Politics of Nature* (2004), which functions as a political philosophy of nature, questioning the role of nature, politics and science in helping to generate a reconfiguration of human society towards what Latour coins the 'collective'. Latour's inquiry departs from Plato's allegory of the cave, in which the distinction between subjective and objective knowledge is formed through the reality of nature outside the cave and the representation of it by humans within the cave. According to Plato, only those who can generate objective knowledge of the nonhuman world are able to transcend out of the cave and deem their knowledge absolute; these people are the philosopher-kings and scientists. In this way, the allegory forms the basis of the role of 'Science' in our contemporary society as rule of thumb for understanding the objective world. Following this explanation, in a bold move Latour informs us that to build the new collective we must reorganise all our understanding of the world on an epistemological level. Latour presents that there is a crisis of 'objectivity' that paralyzes democracy and politics by placing nature on the one hand and society on the other. In accordance with critique on 'nature' thus far presented by the ecocritics, the Western notion of nature is identified as a 'historically situated social representation' – a consequence of the distancing from the reality of things. This is, as explained, also the primary proposition of the

allegory of the cave. The goal of the book is to break down the existing configuration of nature and society to allow for a new one to emerge.

The first aspect of this is to distinguish between 'Science' as objective understanding and 'the sciences' as experimentation, that is to emphasise that their mismatch is what hinders us from progress; parallel to this is the respective philosophy and practise of ecology. The role of ecology is to provide a basis of inquisition from which to begin constructing the new configuration – or as Latour coins it, the collective. This new structure includes propositions which help establish the quality, necessity and purpose of 'every element' in our world. To steer away from the crisis of objectivity, Latour does away with the terms subject and object, replacing them with 'propositions' under the claim that all entities in this world articulate consequences for the collective. To say therefore that an object exists in nature without any impact on humans (and vice versa) is an impossibility. Latour proposes establishing a new 'order' for society through defining a collective according to a certain set of principles that define the role, hierarchy and functioning. The three fundamental 'powers', as Latour refers to them, help structure the collective. These are the 'power to take account', 'power to put into order', and the 'power to follow up'. The first refers to the continuous need to evaluate the external reality of the collective so to not simplify the number of propositions that are to be taken in account, and to ensure that these propositions are articulated accordingly. The second refers to analysing the compatibility of the new propositions to those already instituted a part of the collective and institutionalising and legitimizing those propositions once a position has been found. The third is an administrative power, ensuring that the feedback and learning phase of every experiment and consultation in the collective is not lost. Through these three phases a cycle of (1) consultation and experimentation, (2) evaluation, and (3) learning a fruitful common world is created for both humans and nonhumans.

As a final point the importance of the notion of time in these proposals must be emphasized Modernists see progress and improvement as unidirectional, and so time must also be linear and non-repetitive. White Jr. (2015) argued that in Antiquity cyclical notions of time were popularised, proposing that with the domination of Christianity the notion of cyclical time was forgotten. A return to such a cyclical form of thinking is recognised in second-wave ecocriticism and the ideals of political ecology. Latour supplements the modernist theory of time as progressive by adding a second arrow in the opposite direction through the aforementioned 'power to follow up'. This second arrow is coined the 'learning curve', with the specific function to look retroactively. In a more practical sense Latour indicates that this

is maintained by administration to keep track of progress thus far. The focus of this power is to return to propositions which have been deemed irrelevant for the collective before to test whether they are now still irrelevant. Although Latour's proposal seems radical at times in its attempt to completely rearrange the foundations of political structures, Latour shows that it is not the entire essence of modern humanity that must be deconstructed. Rather, it is only a manner of reorganising our relations to our natural and biological existence within this world.

The Critique on Environmentalism

The environmentalist movement runs parallel to ecology although ecologists often remind us that environmentalism is highly limited in its practical capacities. Whilst ecology is both a philosophy and a practise, with evidently no lack of discourse, environmentalism is an activist practise informing organisations and artists on 'implementing change' against the global environmental uncertainty and destruction. Environmentalism roots itself in notions of conservation and preservation, quite literally protecting the 'environment'. However, with the rise of ecology and social cultural involvement in the environmentalist tradition, such as the arts, much critique has been discussed on the dysfunctionality of environmentalism in practise. Here I would like to discuss a specific response, the text 'The Death of Environmentalism' (2004) by Ted Nordhaus and Michael Shellenberger. The text presents the result of research into trends of 'modern environmentalism', the role of environmentalists in society and how to close the gap between the problems they know and the solutions they propose. Nordhaus & Shellenberger claim that modern environmentalism no longer deals with the world's most serious ecological crises, nor is it capable of doing so due to a discrepancy between thought and practise. The primary reason for this is the inconsistency in what is meant by the term 'environmentalism'. Fragmentation in the definition of the term resulted in the incapacity of thinking about politics whilst constructing policies, as the community is disconnected in any attempt to find a common goal. Before delving further into the text, a disclaimer should be given that this text was received with controversy and criticism from the environmentalist movement, though ultimately informed a new movement coined 'ecomodernism', which I will further explore below.

An inconsistent discourse throughout the environmentalist community is exemplified in several instances, as identified by Nordhaus & Shellenberger. Firstly, research presented that although the backing of the environmental program is large, it is not loyal nor deep. On the one hand, a wide portion of the population is touched by the problem defined. On the other, they are not

particularly motivated by the need for change or feel any sense of responsibility. Secondly, the ineffectiveness of the policies proposed by environmentalists is due to the fundamental mismatch between the problems and solutions proposed. Here, the framing of the problem is cultural, arguing that how humans relate to the environment should be reworked. However, through asking for this cultural redefinition, the movement also asks for pragmatic, technical legislative proposals. By doing so, incremental change, measured in terms of technological advancements and numbers such as percentage decrease in greenhouse gas emissions, is accepted as overcoming great challenges. Yet, the core cultural problem is not solved. By addressing the core of the problem, environmentalism might be able to move more people through maintaining a cohesive set of values in line with solving the current environmental crisis.

I propose that for a politics that effectively solves global warming to take form, we must take the stance of Nordhaus & Shellenberger and align the discourse with that of second-wave ecocriticism. Environmentalist incentives and interventions should advocate for a renewed political structure as outlined by Latour and relate to nature through the theory proposed by Morton. As stated by Nordhaus & Shellenberger, environmentalists must tap into the world of representation to generate a cultural revaluation of the relationship between humans and nature. To shift towards this cultural revaluation, it must first become clear what the place of technology should be.

What to do with Technology

As mentioned in the opening of this chapter, technology has so far been a particularly absent theme in this thesis discussing contemporary culture. Technology is however essential in the construction of the urban, a basis to capitalism as we know it today, and a key part of the industrial revolution. The theme technology has not received a central position in ecology, being perhaps limited to the mention of time as instrument to our existence. This section seeks to place technology in the relationship between humans and nature, whilst not losing sight of the entanglement between technology and science. My framework for this inquisition is based on the work by Latour, Morton and Nordhaus & Shellenberger discussed earlier. I will conclude with a commentary on ecomodernist thought as a bridge between ecology, the critique on environmentalism and the role of technology.

As the ecocritical movement developed the hostility towards technology shifted in its role between science, ecology and the environment. Heise (2015) claims that the scientific

intersection with technology is ambivalent for environmentalists. On the one hand, science allowed for nature to become an object for analysis and manipulation, so paving the way for environmental exploitation. On the other, technology has become the tool for social legitimization of environmental politics. Without technology it would have been impossible to reconcile the otherwise invisible consequences of environmental degradation; consider for example atmospheric data to prove climate change. These insights into the state of nature depend entirely on science and technology. As such, technology is particularly useful in informing and legitimizing political decisions on the environment. Yet, as Latour points towards, there is a mismatch between the role of technology and Science (as opposed to the sciences) in its search to find objective truths. To effectively use technology in conjuncture with ecology to create prosperity for both humans and nature requires more emphasis on systems thinking, feedback loops and circularity.

Ecomodernism

Ecomodernism is a branch of ecology which shows the least hostility towards technology. On the contrary, ecomodernists believe that the solution to the current global climate crisis is by using technology more intensively. Traditionally, ecology is resentful towards technology and aim to recreate the 'bond' between human and nature. Latour, a subscriber to ecomodernist belief, however claims in the text 'Love your monsters' (2012) that technology should be embraced and develop an ever more intimate and attached relationship with and between human and nonhumans. The problem with ecology for Latour is the consequence of abandoning technology, presented in this text as reading *Frankenstein* as a parable for political ecology rather than a cautionary tale against technology, as it has been in popular imagination. Political ecology as such must not strive "to stop innovating, inventing, creating, and intervening" (Latour, 2012), but instead use technology in reconstructing the relationship between humans and nonhumans. Ecomodernism thus takes the stance that we should 'modernise modernisation', as proposed by social scientist Anthony Giddens, so to stimulate another process of transition towards a new structure in society that distinguishes itself from the past modernity: Latour's collective.

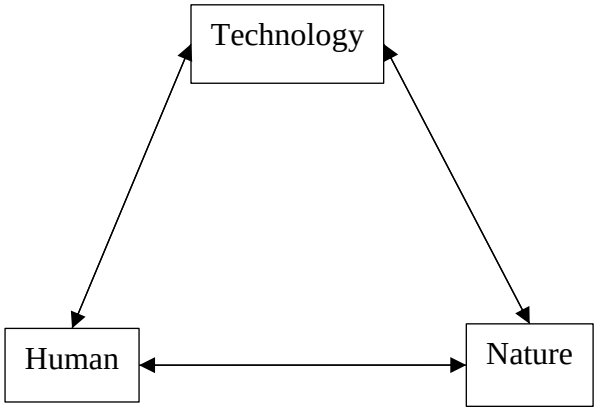
If ecomodernist thought aims to modernise modernity it must step away from the principles that were set in modernity – Cartesian dualism, objective rationality, Science with a capital S. This means redefining our relationship to technology and to science, by redefining nature and our relationship to it away from the modern principles just mentioned. Earlier in the chapter it

became clear that environmentalism and first-wave ecocriticism did not break down the barriers between humans and nature, instead placed the ideal of nature in categories such as 'wilderness'. Ecomodernism builds beyond this by suggesting that we may recover nature by decoupling from it, innovating technology and intensifying technology's use, as proposed in *An Ecomodernist Manifesto* in its effort to put "humankind's extraordinary powers in the service of creating a good Anthropocene' (Asafu-Adjaye et al., 2015, p. 7). This manifesto appraises the role of technology as a solution in its seven-point strategy towards a 'good Anthropocene'. The good Anthropocene is here be understood as something that allows for the development of human civilisation on this earth. There are two components to the development of humans by means of technology. The first is the cultural definition of technologies as having always been part of human life, and thus are our co-creation and -creators (Shellenberger & Nordhaus, 2015). In this way, human, nonhuman and technological nature should no longer be different from one another, and their interaction is essential to contemporary environmental problems. The second is the view that this interaction will allow 'wild' nature to return, thus maintaining a realm of nonhuman and nontechnological nature external to human nature. This is somewhat of a contradiction, one I will return to after discussing the content of the manifesto more deeply.

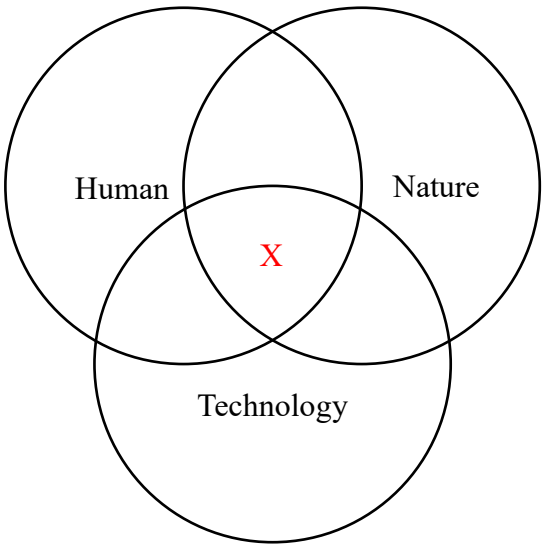
An Ecomodernist Manifesto presents seven points through which the 'good Anthropocene' can be achieved. These points range across different strategies of intensifying human activity, appraising the role of technology as a solution (whilst not forgetting that technology was a central cause to the problem), proposals for decoupling, and most importantly the need to appreciate nature underlining all progress. In many ways the manifesto is antagonistic to the proposals of first- and second-wave ecocritics, most obviously in its ode to technology and its appeal to progress and development. It is however, on the same terms with ecocritics by presenting arguments against environmentalism and demonstrating interest in the political and social capabilities of ecological politics. One clear way in which this is presented is in the symbolic value of cities in decoupling humanity from nature under the second point of the manifesto discussing population. The city is taken as a space of representation for the organisation of society that allowed for the greatest efficiency in material needs whilst reducing environmental impacts. This strongly correlates with the notion of 'homo urbanus' mentioned earlier and so only reinforces the dichotomy between human and nature.

The last point mentioned is the greatest contradiction within ecomodernism, in the attempt to claim that although technology is 'natural' and greater intensification in the use of technologies

which will lead to decoupling, this will allow a return of 'wild nature'. However, in turn, this will make humans more 'unnatural' as they are placed further away from 'wild nature' (not even nonhuman, as technology would now be classified in nonhuman), and allowing for new dichotomies to form. The process of modernising modernisation in this context is antagonistic to the goals of ecology as one that presents a world where the dichotomies are broken down. The greatest distinction between ecomodernists and related theorists (those referenced here being Latour and Morton) is that technology in this way is a means through which the 'sustainable' future will be achieved, whereas under the discourse of Morton and Latour, technology is only one node in a complex network of behaviours. Morton's proposal for ecology without nature for example sees technology as a tool, but wishes to remove the distinctions between nature, human and technology. This is much more constructive as it allows for a collective, as presented by Latour, to form under a new network of relations. Reorganising the dichotomies as ecomodernism does will eventually only lead to a similar trap of limited categories modernity had led us to so far.



Model A



Model B

To exemplify further the formation of the collective, within an understanding of ecology without nature (see model A and B), model A shows the configuration of relationships between the human, nature and technology in the modernist tradition. Here, all are separated into distinct categories, and interaction occurs between each of them. Impacts and consequences reach each category and appear autonomous. The goals of political ecology are then isolated and have shown to lead to unproductive suggestions such as technical solutions without a cultural

revaluation. Model B is inspired by the ecomodernist tradition and the theories by Latour and Morton. Morton proposed a disruption of the categories human and nature, whereby the distinguishing features should not be entirely ignored, but we should work to overlap each category. The overlapping circles visualises this paradox, where the distinctions remain very real but are not entirely separated as in model A. This allows for a deeper understanding of the relationality between each element as they are considered simultaneously. Furthermore, Latour proposed a collective with intimate feedback between the different actors for their different roles; actors may be either human or nonhuman, and so are presented within the central area of the diagram where the red 'X' is placed. Political ecology functions in this area, and the (sustainable) city should strive to operate by these principles. In line with the goals of ecomodernism, the area of political ecology does not ignore the function of technology in the present condition but ensures that it remains to be considered in relation to the other components of our world.

Conclusion

The function of political ecology is to occupy the intersection of politics, economy, technology and culture – as highlighted in the quote at the beginning of this chapter – whilst the goal is to search for a solution for the contemporary climate crisis. From the exploration of cultural definitions of nature in this chapter it appears that the solution firstly resides in a redefinition of the relationship between humans, nature and technology. Two new definitions have been proposed: Morton's conceptual paradox ecology without nature, and Latour's contribution to the collective as constructed of the relationship between humans and nonhumans. I have explicitly avoided the discussion around 'environment' as it already exists within the discussion of nature, the environment being seen as only external to humans, and is so perhaps the furthest removed dichotomy from the pluralism I have sought to find at the end of this chapter.

This chapter took a somewhat chronological approach to the theme of ecology, seeking first to outline the development amongst ecocritical theorists and ultimately arriving at the contemporary understanding of ecomodernism. Perhaps the main point that should be taken from this chapter is the necessity of revaluating and redefining humans and nature. The previous chapter demonstrated that by taking a purely scientific stance on the Anthropocene and its associated environmental impacts, only a superficial understanding is gained. In this chapter, the critique of technological solutions that environmentalists sought, demonstrated the

same point: the climate change problem does not reside within science. Similarly, homo urbanus cannot understand how homo sapiens lived with nature, and so romanticises it. For politics to effectively address climate change it must work away from dichotomies and romanticising towards an ecology of humans and nonhumans. In the same way, for cities to become sustainable, they must ecomodernise in a way that even the furthest removed from nonhuman nature does not see nature as so far apart from humans after all. With this reformation of the goals of political ecology, we can now inquire into how the model holds up against case studies.

Chapter Four:
Political Ecology in Practise

Having delineated the goals of political ecology, at outlined by Latour, in line with several eco-movements, we are now left with the question: How to ecomodernise whilst not losing sight of the entanglement between humans and nonhumans? In Latour's words, "what is to be done? Political Ecology!" (2004, p. 221). This chapter focuses on constructing a methodology through which to work towards answering the political ecology question in the context of building the 'sustainable city'. Doing so requires encapsulating the diverging fields addressed in the previous chapters in a coherent set of questions relevant to the case study. To recapitulate the work done so far, the fields mentioned were that of urban planning and sustainability (chapter one), the Anthropocene debate (chapter two) and the varying trends of ecological thought (chapter three). In each chapter a synthesis of prevalent theories was presented alongside a critical review of their use. In all, the first three chapters sought to outline the boundaries and relevant framework for this research, meanwhile representing the interdisciplinary nature of the problem of urban sustainability.

The scope of this research is the analysis of two festivals as a comparative case study, from which to extract how 'sustainability' as a set of values is presented by means of the model of political ecology. As such, the methodology explores the crossover between firstly, urban experimentation as urban sustainability strategy, and, secondly, the festival as autonomous cultural object for inquiry. Comparing two case studies allows for the translation of the theoretical questions to a practical context, explained through the contrasting settings of each case study. This chapter is separated into two main sections. The first section develops the crossover between the festival and urban experimentation and place this is in context of two case studies: *DGTL* and *Burning Man*. The second section presents the methodology with which to conduct the analysis in the following chapter.

Political Ecology: Remaining Questions

In the previous chapter I established the goals for political ecology, in the context of urban sustainability, as to govern a city that recognises the entanglement between humans, technology and nature. The question remains how to place this into practise, how might political ecology function in the city? Latour (2004) presented a seven-task framework that built the foundation of establishing, organising and reorganising the collective. However, as Latour outlines himself, this is a radical organisation that is done through redefining the role

of all the articulated propositions (human and nonhuman) in the collective. Doing so depends on a continuous re-evaluation of the role of everything in the collective. In practise, and in line Latour's appraisal of the *sciences*, this refers to continued experimentation to find an optimal organisation through reflexive learning. Urban experimentation as a framework for inquiry in practise here presents a parallel theoretical avenue.

The role of technology in cities remains essential to construct the cities of the future. Without technology, we cannot build cities. It is the danger of 'modernisation' that must be avoided here. Instead, as Latour proposes, we must ecologise. The question here then becomes: how do humans relate to technology?; what is the function of technology in nature?. These questions are not distinctly different from the questions Latour poses with regard to the organisation of the collective but allows us to translate the terminology to words more fruitful for a practical context. It must also not be forgotten that technology was not disavowed in the collective, it is after all a proposal that builds upon ecomodernism. Furthermore, technological innovation, in line with human agency, is essential to developing the sustainability solutions to overcome the problems of the 'Anthropocene'. It is the relationship between humans, technology, and nature that remains in question.

Theoretical Crossovers

Urban Experimentation

In chapter one, urban experimentation, as a response to the incoherence of analytic structures and methodological pluralism in sustainability, was brought to the scene. It was identified that sustainability as a term is characterised by a split in ideological approaches. The only real consensus was to be found in the importance of highlighting interconnectivity and systems thinking in the quest for new models for a 'sustainable city'. Experimentation, as a theoretical framework, is useful in overcoming dissensus by emphasising innovation and multiplicity of ideas (Evans et al., 2016). Experimentation for a concept for urban planning in this way is useful in its ability to generate new models. In the context of this research, experimentation is fruitful in exploring new models of relationality.

The book *The Experimental City* (2016) (edited by geographer James Evans, architect and urban researcher Andrew Karvonen, and institutions and transitions theorist Rob Raven) is a guide to urban experiments by presenting the different possibilities of governing cities with and for urban experimentation. In this book, urban experimentation has explored a strategy for reshaping practises of knowledge production in the city. A sustainability experiment is defined

as “planned initiatives that embody highly novel socio-technical configurations likely to lead to substantial (environmental) sustainability gain” (Sengers et al., p. 19). Similarly, the function of these experiments is presented as generating the possibility to “create powerful shared values by letting people experience a different possible future” (Evans et al., 2016, p. 2). Urban sustainability experiments in this way are inclusive, practise-based interventions for social learning geared towards a specific challenge, for example environmental sustainability. The urban experiment directs its attention to the social and material context in which the urban change can be embedded so a transformation literally ‘takes place’ (Evans et al., 2016). Evans et al. assert that the future of the city is guided by a governance of research and development and social learning; this socio-technical transition being coordinated by the urban experiments. Understanding these experiments as microcosms, referred in the literature as ‘niche experiments’ (Senger et al., 2016), allows a physical place to establish the research on social learning, thus providing a preliminary playground to test the development of a new relationality.

The Festival

The field of festival studies lies within event studies and focuses on analysing congregations of people centered around a certain value or function within a specific spatial-temporal frame. Festival studies emerged as a distinct field because of the unique place festivals occupy in almost all cultures and so are of interest to anthropologists and sociologists (Getz, 2010). The cultural-anthropological definition of a festival is presented by anthropologist Alessandro Falassi as “a sacred or profane time of celebration, marked by special observances” (1987, p. 2), extended to a “cultural event consisting of a series of performances or works in the fine arts” (1987, p. 2). With the evolution of festival studies, the definition has become more inclusive to a variety of events. Key elements in the definition are festival characteristics: repetition, specific time frame, spectacle, celebratory of communal values and identity (Getz, 2010; Wilson et al., 2017). The festival and its community – its visitors, organisers, and the locality within which it is embedded – are united through the social and cultural dimension relating to communal values and identity (for example language, ethnicity, religion or tradition).

The most crucial element in defining a festival is its existence as a modality to daily life (Falassi, 1987). Festivals inhabit an autonomous temporal space within the borders of the festival ground during which the participant’s behaviour is diverging from their norm - whether

that is to take up a new action or to avoid action that pertains to their patterns of daily social life. Furthermore, the festival experience is curated with the goal of promoting a specific cultural value. On the one hand, the autonomy of the festival makes it an ideal testing ground for introducing new cultural values and behaviour, particularly as the design of the festival can guide its visitors. On the other hand, the modality of the festival makes it difficult to extrapolate the behaviour and values prominent in the festivals to everyday life.

The festival as urban sustainability experiment

By focusing on the proposal of urban experiment as a microcosm, parallels can be found with festivals. Firstly, festival grounds are clearly marked with a border thus maintaining a spatial and temporal autonomy. Secondly, the repetitive nature of festivals creates an ability to track changes, such whether a cultural value is becoming more or less popular as indicated by visitor numbers per year. Experiments similarly are isolated and must be repeated in order to test the outputs. Alternatively, taking the route of understanding the city as experimental presents the need to pay more attention to transforming the highly interconnected and materially obdurate city level socio-technical systems (Sengers et al., 2016). The festival's autonomy is here again useful as the material restraints of the city do not apply as strongly. By placing an emphasis on 'learning by doing' (Sengers et al., 2016), festivals may provide the opportunity to form new behaviours that lead the transformation of the city.

Insights gained from reading the festival as an urban experiment are however limited in application precisely because the festival's autonomy. According to Falassi's definition (1987), understanding the festival as a sustainability experiment requires promoting the sustainability value in a way that can be extrapolated to city-wide implementation, without expecting the festival-goers to carry forth their 'sustainable behaviour' beyond the festival terrain. Transformations of the city as a sustainable space requires the re-contextualisation of the insights from the festival to the systems embedded in the city. In this research I focus on the infrastructure the festival builds that curates the behaviour of its visitors in line with 'sustainability' as a cultural value. This requires understanding the relationality between the visitors and the objects of the festivals, as outlined by the political ecology framework. Chapter three concluded that the city is to be governed by the principles of Latour's collective, as presented by the model B (page 34), where the 'x' can be read as both the collective and the city. By highlighting the parallels between the city and questions regarding governing, change in the city may become synonymous to Latour's question of governing the collective.

Introducing the festival as an urban experiment creates a microcosm in which to test this model. To understand the context of the case studies more clearly, what follows is an introduction to *DGTL* and *Burning Man*.

Case study: *DGTL Amsterdam 2018*

DGTL is an organization that produces techno music festivals and events. The first edition was held in Amsterdam in 2012, however their festivals have now expanded to editions in multiple cities across the world such as Tel Aviv, Barcelona and Sao Paolo. In 2017 the organisation declared it will create the 'first circular festival' (Galle et al., 2017), meaning it will structure its resource use in such a way that there are no waste materials. All 'waste' materials will be either recycled, upcycled or reused within the organisation or by partners. Furthermore, the festival is part of the 'Green Deal Afvalvrije Festivals' initiative, an initiative which set specific goals on the reduction of waste at festival in the Netherlands by both organisers and visitors. Green Deal states that with 700 festivals in the Netherlands, attracting 21 million visitors a year and each visitor leaving 2.33kg of waste on every festival terrain, this is a huge opportunity to encourage organisers to structure their festivals so that visitors are encouraged to be more conscious about their waste (Grean Deal, 2015). Out of the signees of this deal, DGTL has made the most prevalent steps towards creating entirely waste-free festivals.

The principle is that by reducing waste, and reconfiguring the current waste as resources, the festival becomes more sustainable by demanding less raw resources from the planet. As such, the primary lesson *DGTL* wants to teach its visitors and community is 'consciousness with (waste) materials'. To analyse its waste-materials and resource flows the festival has collaborated with sustainability consultancy firm Metabolic since 2017. The first report was an initial analysis of the material flows for *DGTL* 2017 functioning as a benchmark. Following this, the goal set for *DGTL* was to analyse the waste from visitors more specifically, through the help of on-site analysts. 'Visitor waste', such as cigarette packaging, was the largest remaining section of waste material identified by the 2017 Material Flow Analysis (MFA), and the only material flow that is beyond the control of the festival organisers. This indicates the desire to address not only technological innovation and procedural changes to make *DGTL* more sustainable but also the socio-cultural and behavioural element of sustainability at the festival.

Case Study: *Burning Man*

Burning Man is an annual festival held at Black Rock City, a temporary city erected in the Black Rock Desert in Nevada. The first edition of the festival was held during the summer solstice in 1986 on Baker beach (San Francisco) as a small event organized by Larry Harvey and Jerry James centered around 'burning the man' (the burning of a wooden human effigy) as a performative event (Burning Man Project, 2017). Created around the notions of self-expression, performance and community, the event quickly began attracting more participants; on the eight edition the festival had grown from a small gathering of 20 people to 1,000 visitors. In 2017, the festival saw nearly 70,000 visitors.

One of the central tenants of success of *Burning Man* is that of 'prosumption'. This notion refers to the simultaneous consumption and production of the experience by the festival goers and is integral to the *Burning Man* experience (Chen, 2012). As such, meaning at *Burning Man* is primarily constructed through the presumption and only supported by minimal interference by the organisation. This is additionally encouraged by the *Burning Man* principles, which are intended to stimulate a community where radical self-expression and participation are central. Furthermore, since 1995 every edition of *Burning Man* has been given a theme to give shape to the festival; the 2018 theme is 'I, Robot'. However, this theme is only intended as a guideline for creative expression. Through exhibiting these (non)structures, the festival has been categorised as a 'transformative festival', where the individual experience is central.

The rapid growth of *Burning Man* to a spontaneous yearly urban structure has encouraged the organisation to track its census. Since 2004 census reports to document the development of Black Rock City and its community have been published (Burning Man Project, 2019a). These reports are used by the organisation to improve the experience and reduce the festival's environmental impact. Similarly, the festival has attracted a plethora of academics to conduct research into the community, its attitudes and its behaviours (Burning Man Project, 2019b). This research complements the findings of these studies by supplementing the analyses of behaviour and attitudes at *Burning Man* with a specific focus on the relation with sustainability.

Analytical Framework

Comparing *DGTL* and *Burning Man* as case studies is a testing ground for applying the political ecology principles in practise. As an overarching question, the analysis aims to see if the socio-technical organisation for both festivals reflects the goals of political ecology. Having presented the festival through the lens of urban experimentation, thus identifying the context

of the theory and the applicability of the case to the urban context, this section develops an analytical framework in line with the aim just mentioned. If the festival functions as a transformative agent in the relationship between humans and nonhumans, then the goals of political ecology can be found in the sustainability discourse presented by *DGTL* or *Burning Man*. For consistency across the research, I retain the terms human, nature and technology as outlined by model B (page 34) but use the relationality principles between humans and nonhumans as outlined by Latour's theory of political ecology.

By bringing together the themes outlined in the first three chapters, and the remaining questions for political ecology, I outline three research questions to inquire into the sustainability discourse of the festivals. The three questions are 'how' questions, requiring firstly an identification of 'what' the current mode is, and secondly 'how' this is enabled. Furthermore, the questions build upon one another, where the first focuses on defining sustainability, the second the role of technology, the third on relationality. In answering the questions in the following chapter, I will be addressing the festival's communication material, festival terrain design including art installations, and sustainability reports.

Question 1: How does the festival promote agency?

Primarily this question asks if the festival promotes 'agency', and if so, in what context. In chapter two I established that a central component of the developing a sustainability culture would be to develop a sense of agency in the relationship between humans and nature. On that premise, if the festival advertises sustainability, it must also be advertising agency. Therefore, the first sub question is: 'how is sustainability as a cultural value promoted at the festival?'. To answer this, the materialisation of sustainability must be identified, in addition to how the festival-goers are able to act in accordance with this value within the festival - in other words, how festival-goers are able to 'learn by doing'.

However, in Latour's collective agency also lies in non-humans. Therefore, a further dimension to this question is to identify how nonhumans are translated into 'articulated propositions' (Latour, 2004). If the festival does not articulate propositions it would lead to the conclusion that a traditional ecomodernist approach is taken to sustainability. At this point there is a fine line between the first and the third question (as is outlined below) in where to address the question of the subject-object divide. As such, question one focuses primarily on the 'human agency', question three will also address nonhuman agency.

Question 2: How is the function of technology communicated at the festival?

Question two focuses specifically on technology at *DGTL* and *Burning Man*. In the case of *DGTL*, the role of technology is linked to the form of sustainability it presents. Two trends can be already identified with limited knowledge of the festival: 1. the festival plays 'techno music', a technological genre of music, thus the relationship with technology is intrinsic to the cultural theme it presents, 2. *DGTL* aims to improve its sustainability performance through the use of the MFA as a tool. These two trends represent an ecomodernist approach - a faith in technology to overcome the problems of today. *Burning Man*, on the contrary, advocates a return to nature through the choice of its location. Additionally, meaning is here primarily constructed through the participation of the festival attendees; also, in relation to technology. Technology still plays a role at *Burning Man* in the most practical sense, with regard to the functioning of the festival during the night time.

In answering this question, I will firstly dissect what the practical functions of technology are at *DGTL* and *Burning Man*. Secondly, how these functions are communicated to the festival-goers by the festival organisers. The second aspect of the question has significant overlap with the first question, therefore the answer to question two is limited to the role of technology specifically.

Question 3: How does the festival curate (and manage) the relationship between humans and nonhumans?

The festival organisation can curate a relationship between humans and nonhumans that differs from the one present in everyday life; this is the modality of the festival. As such, question three explores what the relationship between humans and nonhumans the festival organisation curates. In this way, the festival is presented as a mediator between humans and nonhumans that in some way transforms the relationship between the two groups. By bringing together the answers to the previous two questions, answering this question is the search for the interaction between the different entities at the festival. This question presents the strongest link in the translation of political ecology as a framework to testing in practise. An important sub question here is a question that Latour has also presented: 'is there a subject and object?'. Latour (2004) argues that the subject-object dialectic must be overcome in order to build a well-governed collective. To avoid an overlap with the previous questions, answers to question three clearly link back to the topic of relationality while avoiding to identify the position of each entity at the festival

Conclusion

Conceiving of the festival as an urban sustainability experiment presents a pathway for outlining the goals of political ecology in practise. The remaining questions outlined at the beginning of the chapter are similar to the questions posed in the previous chapter yet differ in that they are placed in the context of the case study. Testing the goals of political ecology was theoretically contextualised by framing the cross-overs between the festival and urban experiment in line with urban sustainability. Autonomy (spatial and temporal) as a main characteristic of festivals provided a particularly fruitful ground to build parallels with the urban experimentation theory. One main limitation of this approach is that festivals hold a modality to everyday life, meaning that only insights can be extracted from the festival as microcosm. Application of these insights to the development of urban planning for sustainability may be limited.

The case studies will be analysed in the following chapter through the analytical framework presented in the final section of this chapter. The three questions presented are leading in the translation of political ecology to practise. We are now ready to move to the presentation of the results and discussion in chapter five.

Chapter Five:
Comparing *DGTL Amsterdam* 2018 and *Burning Man* 2018

This chapter explores a comparative case study between *DGTL* and *Burning Man*. The results presented here are by no means exhaustive descriptions of the festivals, both events are much too complex and broad to be able to address all facets within the scope of this research. Instead, the results are structured according to the three questions posed in chapter four, which inquire into how political ecology might be understood when put into practise. In the following chapter – the conclusion – a stronger theoretical link will be built by bringing together the several subject themes addressed in the previous sections of this research and present what trajectories for future research open up.

Question 1: How does the festival promote agency?

In the context of this research, the notion 'promoting agency' can be split up into three elements to be identified at the festival: (1) sustainability as a cultural value, (2) how is this communicated, (3) how sustainability is materialised. The cultural value of sustainability at *DGTL* and *Burning Man* are similar in their attempts to leave the festival ground at the end of the festival in the way it was found before the start, so that the sum effect of human activity on the local area is zero. *DGTL* has manifested to taking on the challenge to become the 'first circular festival', meaning it will produce zero waste, solidified by signing a Green Deal for sustainable festivals (Green Deal, 2015). *DGTL* acts on this by implementing technologies to manage the flow of resources through the festival, referred to by the organisation as 'sustainability initiatives' (Metabolic, 2018). It is these technologies – such as the pyrolysis machine, waste water treatment, solar panels, hard cups collection system and compost machine – that enable the festival's sustainability culture (I will expand on this in answering question two). As such, the cultural value of sustainability at *DGTL* is intrinsically tied to the use of technology.

Sustainability as a theme is communicated through two main avenues by *DGTL*: (1) advertisement, (2) on-site signage. Both fall under the umbrella 'DGTL Revolution', a branch within the DGTL organisation that focuses on the development of a sustainability initiative and platform. The first consists of the communication material to inform the public about DGTL as an organisation and what to expect from the festival, including short movies and documentation of the revolution movement, focusing on the musical genre and ideology of the festival. Human agency can be understood through the revolution movement at *DGTL* as it

generates the infrastructure through which individuals may get involved with the sustainability efforts of *DGTL*. Fishing for plastic in the Amstel river and gardening at urban farms using the compost produced at the festival are two examples through which the revolution interacts with the city and encourages involvement.

Figure 1: Circular Food Court retrieved from https://www.facebook.com/dgtlfestival/photos/a.1595997140512974/1596032157176139/?type=3&theater

On the festival terrain signage, the second element of communication, plays an important role in curating the behaviour of individuals at *DGTL*. The signs predominantly refer to the translation of the term 'waste' to 'resources', as exemplified by the sign in the food court stating ">>> RESOURCES >>>" (figure 1**)** as an indicator where festival-goers should dispose of their food rests. Similarly, the 'recycle hub' (figure 2), is an element of the "Resource Street", where resources, not waste, are managed (DGTL, 2018). DGTL Revolution also takes form on the festival terrain by coordinating volunteers that take on roles related to sustainability, for example sorting and collecting waste. Volunteers are rewarded with an entrance ticket for the festival, thus creating a sense of belonging and community at *DGTL* through collaborative effort. In communicating sustainability through these two forms, *DGTL* creates an agency that stems from the human capacity to redefine their relationship to materials – in a very literal

sense of redefining ‘waste’ as ‘resources’ – while building an infrastructure – the revolution – through which humans can take part in effecting that culture.

Figure 2: Recycle Hub retrieved from: https://www.facebook.com/dgtlfestival/photos/a.1595997140512974/1596025187176836/?type=3&theater

To expand on the notion of agency in line with the Anthropocene theory, *DGTL* presented the work *Ferrotopia* (2018) by Atelier van Lieshout (AVL). This is the most iconic artwork at the festival and has remained on the NDSM docks as a public museum. The installation is made up of four buildings by AVL: *Domestikator*, *Drop Hammer house*, *Happy Industry* and *Refectory*. The iconic totem *Domestikator* (figure 3) depicts humankind’s domination of nature through visualising sexual intercourse between humans, animals or robots. AVL maintains that the image is not intended to be explicitly sexual, but rather encourage audiences to think (Muñoz-Alonso, 2017). The entire installation is a tribute to mankind’s industrial history while questioning the future by exploring new forms of manufacturing. The name *Ferrotopia* is an ode to an ‘iron paradise’, and so recognises steel and its associated industries (NDSM, 2018). As such the installation brings to the forefront the world of craft, iron and other types of material man could use, referencing the importance of having knowledge about how things are made and the materials we use. This installation clearly references the relationship between man and nature by representing man’s domination over nature and how that relationship is shaped and transformed through technology. AVL has here constructed an installation that

stimulates reflection and thinking, in addition to raising awareness about contemporary issues of production.

Figure 3: Ferrotopia (2018) retrieved from: https://www.ateliervanlieshout.com/news/

Furthermore, *DGTL* manifests its commitment to zero waste visually through two artworks; a Neptune statue and *Exploded Container*. The Neptune statue was produced by Greenpeace (figure 4), constructed out of wood panels and a large finishing net. Its original function was to advocate for the implementation of a deposit on disposable bottles and cans by depicting Neptune dragging a large net filled with empty bottles. With its presentation at *DGTL* however the net is nearly empty as a representation of *DGTL*'s implementation of a reusable hard cup system. Still, the statue again stands primarily to raise awareness on plastic use. This iconic towering figure also reminds the visitors that they are a small component of the Earth yet reiterates the anthropocentric capabilities of managing plastic resources. *Exploded Container* (2018), by visual artist and architects Marisja Smit and Thuis Trompert from ATM Model art, is an installation made of entirely reused wooden pallets emerging from a container (figure 5). The installation was constructed so that it could be easily taken apart and the wood distributed for reuse at the end of the festival. This installation alludes to the sustainable use of materials and so simultaneously raises awareness to material use and contributes to the reuse of wood.

Figure 4: Neptune statue retrieved from: https://www.facebook.com/dgtlfestival/photos/a.1596984693747552/1597020790410609/?type=3&theater

Figure 5: Exploded Container (2018) retrieved from: https://www.facebook.com/dgtlfestival/photos/a.1595997140512974/1596022347177120/?type=3&theater

In comparison, *Burning Man* is a festival whose culture is constructed by the festival goers, commonly referred to as 'burners' (Burning Man Project, 2019c), confined only by the ten principles outlined by the Burning Man Project. Intended to guide how people should behave and act in relation to one another at the festival, the principles encourage responsibility for the self, participatory behaviour within the larger community and respect for nature. The ten principles are: radical inclusion, gifting, decommodification, radical self-reliance, radical self-expression, communal effort, civic responsibility, leave no trace, participation and immediacy (Burning Man Project, 2019d). I will explain each in more depth as they become relevant for the research. Of these, 'Leave no trace' is the principle that reflects (environmental) sustainability most directly, proposing that the area where the festival is held – Black Rock Desert – returns to its original form after Black Rock City (the name of the festival area) disappears every year. In the terminology of *Burning Man* this is explained as to remove all MOOP – 'matter out of place' – brought to the area by humans for the festival (Burning Man Project, 2019e). A team of volunteers is implemented at the end of the festival to check the status of MOOP, remove it if necessary and document it for the Black Rock City census report.

The ten principles furthermore align the need for building a community and culture within which everyone is involved at Black Rock City. Anthropologists that have researched *Burning Man* have found that this can primarily be explained through the term 'prosumption' as one of the main tenants of the *Burning Man* experience (Chen, 2012). This takes form through the disavowal of spectatorship (relating to the principle of 'participation') within the event through which visitors become producers, not just consumers, of the culture, art and experience at *Burning Man*. In light of this, 'interactivity' is a key characteristic upon which honoraria artworks are selected to be presented at the festival (Burning Man Project, 2019f). Here it is important to make a distinction that there are certain artworks that are selected and partially funded by the *Burning Man Project* which are on display at the festival. However, individuals are free to bring in any artwork, mutant vehicle (an altered vehicle for use on the 'playa') or other creative expression that may or may not relate to the year's chosen theme. Furthermore, the entire decommodification of the festival and the principle 'gifting' encourage individuals to manifest their expressions to one another and so build a relationality based on genuine intention.

Additionally, *Burning Man* presents a yearly theme to inspire the burners, funded either partially by a Burning Man Project art grant or constructed independently. The 2018 theme presented was 'I, Robot', reflecting on the science fiction stories written by Isaac Asimov on

the relationships between Man and Robot (Burning Man Project, 2018). It should be noted however that artists and burners are not restricted by this theme, it is only meant as a guideline. What *Burning Man* presents with this theme is that any sustainability culture requires the contemplation of the relationship between man and technology. Whilst the individual is entirely isolated from established society, *Burning Man* provides an opportunity to contemplate this relationship while released from any existing societal rules. In doing so, *Burning Man* presents a question as to whether the creation of a sustainability culture requires a reset of modern society in order to envision alternatives. Furthermore, the prominence of the term 'radical' in the principles outlines how *Burning Man* expects behaviour to be at a modality to everyday life (as outlined by Falassi), ensuring that every visitor does their part in contributing to an alternative societal reality. This behaviour is shaped and solidified in the presence of rituals at *Burning Man*, including the yearly 'Burn' where the Man, the Temple and other wooden artworks are burned as symbol.

To make a concluding remark, at both *DGTL* and *Burning Man* the artworks presented have a role of reflecting on the culture that stands an envision ways in which humans may relate to their surrounding in an alternative sustainability culture. The primary distinction that can be made between the two festivals on the ground of agency is that the first constructs a narrative of human behaviour and structures the possible action accordingly using technology, whilst the second proposes that a sustainability culture stems from the idea of community and prosumption. *Burning Man* encourages a culture that has no boundaries so long as it does not stray from the ten principles. Similarly, agency is promoted in contrasting ways at the two festivals. At the former, agency is a consequence of the sustainability initiatives implemented by the festival organisation. In contrast, at the latter, agency is at the core of the manifestation of the *Burning Man* culture. This is to say that there is no *Burning Man* culture without the enactment of ten principles, and the shape of the culture is entirely determined by the individuals that reside in Black Rock City for that *Burning Man* edition.

Question 2: How is the function of technology communicated at the festival?

Already it has been identified that *DGTL* presents a (technological) infrastructure which enables the sustainability culture, whilst *Burning Man* proposes to strip humans back to their element of expression to allow the development of a culture in a community free of external mediation. The extent of the infrastructure that *Burning Man* provides is the minimal required to ensure health and safety at the festival and a productive layout of Black Rock City. The size

of Black Rock City, up to 70,000, makes it so that infrastructure and some level of urban zoning is necessary for the well-functioning of the city and the safety of the burners (Lloyd, 2004). Figure 6 shows how the city plan layout for *Burning Man*. However, Burning Man organization does not provide products, does not allow commercialisation and vending is forbidden within the Black Rock City. Burners are required to take care of themselves, and their material belongings (including trash) independently.

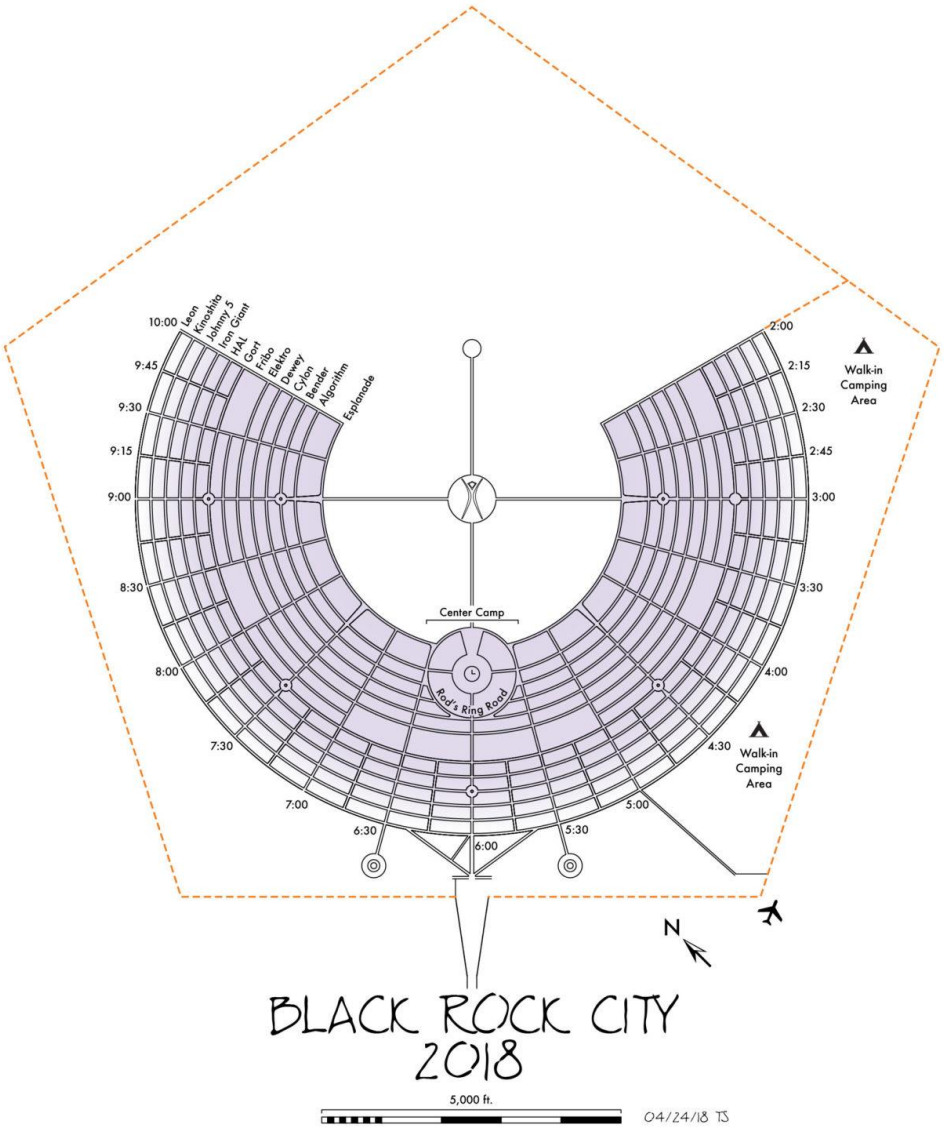


Figure 6: Black Rock City layout retrieved from: https://burningman.org/event/black-rock-city-guide/2018-black-rock-city-plan/

In contrast, technological sustainability initiatives are core elements of the *DGTL* infrastructure. Technology at *DGTL* is presented as a tool for the festival's sustainability, their primary function being to enable the sustainability culture that *DGTL* is a proponent of. As such, *DGTL* is an example of how the implementation of technology and using infrastructure to the advantage of the organisers creates the 'sustainable state' that is a zero-waste festival. On a practical level, technology plays the role of being an enabler of human activity on the front of sustainability but also in the general festival experience. *DGTL* requires that visitors engage with the technologies by adhering to the protocol that the technologies present. To exemplify, the composting system requires that food leftovers be disposed of in the correct bin and hard-cups must be returned to the bar to exchange for a new drink. In this way, the relationship between technology and humans is one that encourages a symbiotic relationship between the two: human's sustainability state cannot be achieved without the technology, and the technology cannot function without the human's cooperation.

DGTL furthermore presents itself as industrial festival, playing music of the 'techno' genre and constructs the stages based on 'modularity' which as a principle stems from computer science. This is most explicitly exemplified by the *DGTL* 2017 aftermovie, which can be considered part of the 2018 case as it is an element of the advertisement campaign for the 2018 festival edition, titled *MODULAR*. The movie maintains modularity as a way of perceiving the world around us as a central theme, presented through both the visuals and audio elements. Alongside clips of festival goers dancing at *DGTL* 2017, the primary visual components are images of an electric board and those of a city. Close ups of the electrical board are shown with a sharp cut to an image of the city to show the synonymy between these two elements of our world (figure 7 and 8), to demonstrate that the city (first image) is like a machine (second image) – an interconnected system of modules. To supplement this, the audio is a combination of electronic music and recordings of lectures on the theme 'modularity', explaining it is a form of understanding where a system is deconstructed to its interconnected elements. One of the lecturer's voices explains that it is still unusual for people to view the world, or any system, as modular even though the concept was already introduced in 1965 in electrical engineering. Nowadays, the logic can be applied to varying fields, from architecture to music. Furthermore, the strategy to manipulate materials is explained through a musical demonstration with a modular synthesiser in the style of the music played at the festival.

Figure 7: DGTL Amsterdam 2017 aftermovie video stills retrieved from: https://www.youtube.com/watch?v=hhn2YAVU1h0

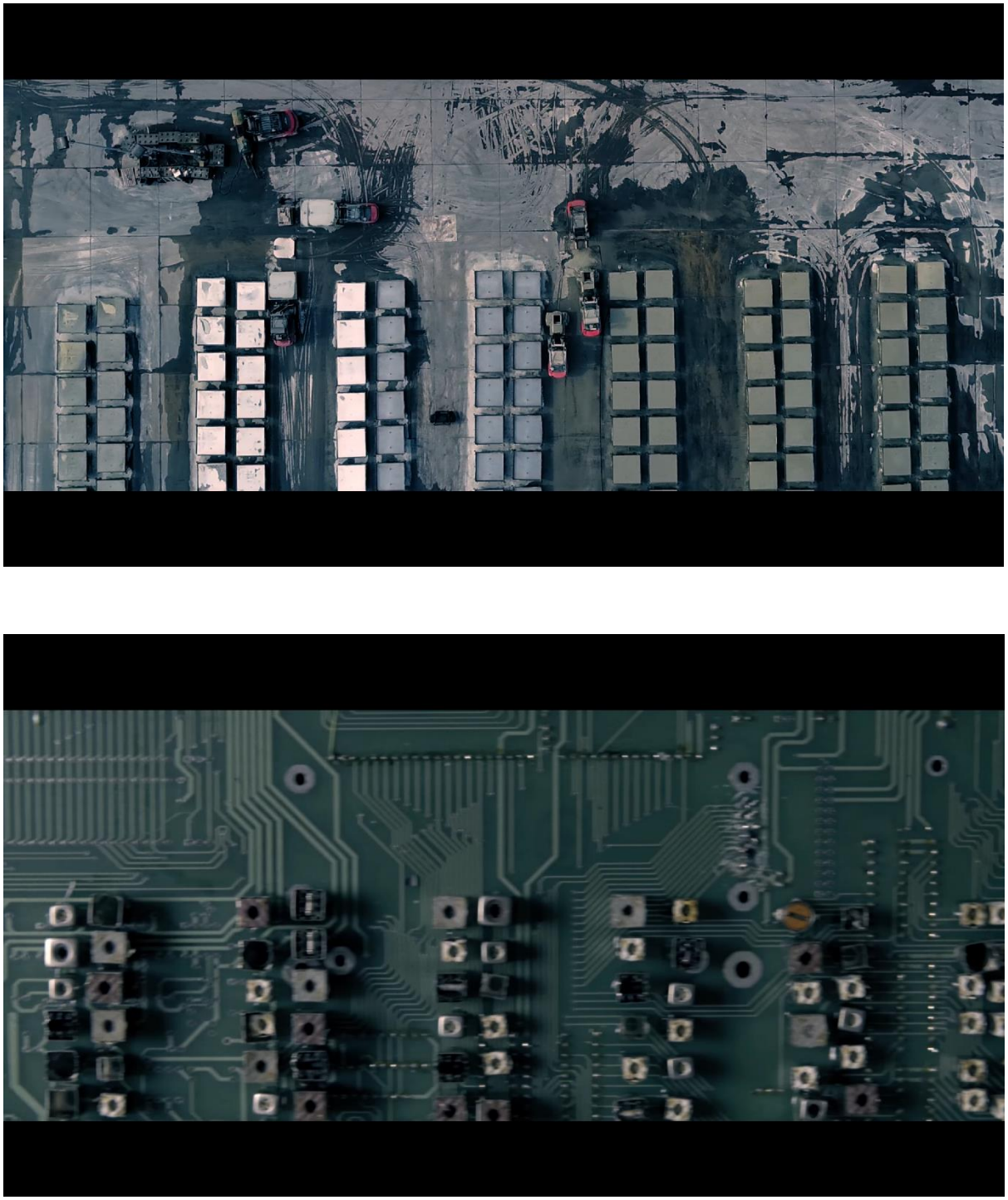


Figure 8: DGTL Amsterdam 2017 aftermovie video stills retrieved from: https://www.youtube.com/watch?v=hhn2YAVU1h0

Another perspective on technology taken at *DGTL* is the artwork presented at the entrance of the festival, *Skyline* (2018) by Nick Verstand (figure 9 and 10). *Skyline* presents how technology can be staged as a disruptive entity. The piece consists of a coordinated light and sound installation piece across the entrance hall of the festival. Sound is animated over an 80-meter distance and augmented by 32 custom built lights to create an invasive and enveloping installation. This installation creates a disruption between the world that the visitor is entering from (daily life) and the world they are entering (the festival), thus marking an iconic moment that interacts with the visitors. Yet beyond functioning as an entrance point for the festival 'world', this artwork reflects on the power of technology to create an entirely different setting. Whilst *DGTL* presents technology as an enabler of the human desire to build sustainable structures, including cities, these two artworks outlined exemplify how technology shapes the human experience also. The aftermovie presents this through likening the city with the structure of that of a computer, and in turn how humans are required to think in the way that technology is structured in order to be able to live unified. Simultaneously, *Skyline* brings this effect of technology on human structure by creating a disruptive immersive experience out of technology. As such, these artworks can be understood as manifestations of the symbiotic relationship previously outlined.

Figure 9: Skyline (2018) video still retrieved from: https://vimeo.com/281495445

Figure 10: Skyline (2018) retrieved from: http://www.nickverstand.com/projects/skyline/

Burning Man on this question again poses several opposites to the *DGTL* case. Firstly, as already outlined, the festival presents minimal infrastructure and even less so technological infrastructure, instead proposing that the (sustainability) culture should emerge out of collective activity. Technology is a point of reference and mostly absent from the structural elements of the festival apart from LED lights used to generate visibility at night in the desert. The role of technology at *Burning Man* is to instead be present as a theme for reflection, the theme 'I, Robot' being the encompassing term for this. Asimov's texts similarly reflect on the role of Artificial Intelligence that entered into human lives into so many ways, by posing questions as to the relationality in the human-machine interface (Burning Man Project, 2018). Here the question is posed: who is the master (object), and who is the slave (subject)? This stance on technology, specifically robots, is communicated with the artwork presented on *The Man Pavilion*. Artists were called upon to envision 'expressive robots', or create art that examines what it is like to live in a world that is filled with robots, who "watch us, track us, hack us, read our tweets and emails, listen to our phone calls, and sell this information to other robots" (Burning Man Project, 2018). There is specific mention that the theme is science fiction, therefore outlining that the relationship between humans and technology should be

articulated differently to that which exists nowadays. Creativity here is the tool used to envision this alternative reality.

The contemporary reality *Burning Man* is addressing is one categorised by consumerism, which makes us crave convenience and seek instant gratification. According to the organisation, this reality points towards an automatised world where human contact is void. Instead, *Burning Man* claims we should be weary of the relationship between technology and humans, staying clear of dissolving our problems into technological solutions presented by the convenience of robots (Burning Man Project, 2018). By taking this notion to the extreme and envisioning a world entirely isolated from the technological society that has been constructed, *Burning Man* questions what it means to be essentially human. As such, the alternative reality *Burning Man* envisions is categorised by a sense of freedom. The 2018 theme and organisation present an idealisation of a post-work world where technology has taken over the role of doing the work. This appraisal of ecomodernism, where technology provides the solutions to emancipate humankind from their problems, provides an outlook into the future where technology and humans are entirely disconnected by the divide between work and leisure.

Figure 11: The Man Pavilion retrieved from: https://gallery.burningman.org/asset/fcfe9c90-647f-46e3-8cf4-c3ac6b22aa92?i=11&q=man+pavilion+2018

Figure 13: I, Musician (2018) retrieved from: https://gallery.burningman.org/asset/f50f7b5f-b033-4d05-ae4b-79d6e3830267?i=9&q=i+musician

Figure 12: Robot Gothic (2018) retrieved from: https://gallery.burningman.org/asset/d7b362e1-82fc-4c90-899e-63471dbf3f31?i=0&q=robot+gothic

The Man Pavilion presents the materialisation of the theme and critique of the relationship between humans and technology. The gear-shaped building houses twelve installations in addition to the Man totem, all of which will be burned during the event (figure 11). All the artworks presented on the pavilion in some way integrate human essence into a robot, so exploring a world where a definition of robots and humans is closer intertwined. *I, Musician* (2018), by Tricia Kelly, (figure 12) traces the notion that robots can also be used in creative ways, such as for music therapy, and claims robots should not be limited to use for assembly line tasks. *Robot Gothic* (2018), by Chelsi Linderman, (figure 13) explores the crossover between science and the arts by creating a robotic rendition of *American Gothic* (1930) by Grant Wood. Additionally, *Robotopod Inclusions* (2018), by Annabel Lee Allen, (figure 14) outlines that human touch and creativity are foundations of the machine. This is expressed through what appears to be uniform resin robots, but instead they are made of different materials that react to light and human touch in different ways. Whilst these three artworks present not much more than mere reflections of how creativity may be intertwined with the

visualisation and materialisation of robots, they exemplify through their presentation of an alternative that society's conception of robots is one entirely isolated from what it means to be human. The artworks *Killbot No More* (2018), by Marco Turrubiartes (figure 15) and *Bare Heart* (2018), by Trevor Twist (figure 16) present an even further cross-over between humans and robots through applying human emotion and expression to the robot. The first achieves this by presenting a rendition of Killbot – a robot designed to kill – that antagonistically reflects on its own consciousness, function and destiny. The second applies the feelings of vulnerability and sense of connection expressed through the revealing of the robot's heart as he stares at the Man. Notably these two artworks outline how in order for humans to relate to robots, the robot must acquire some kind of human behaviour.

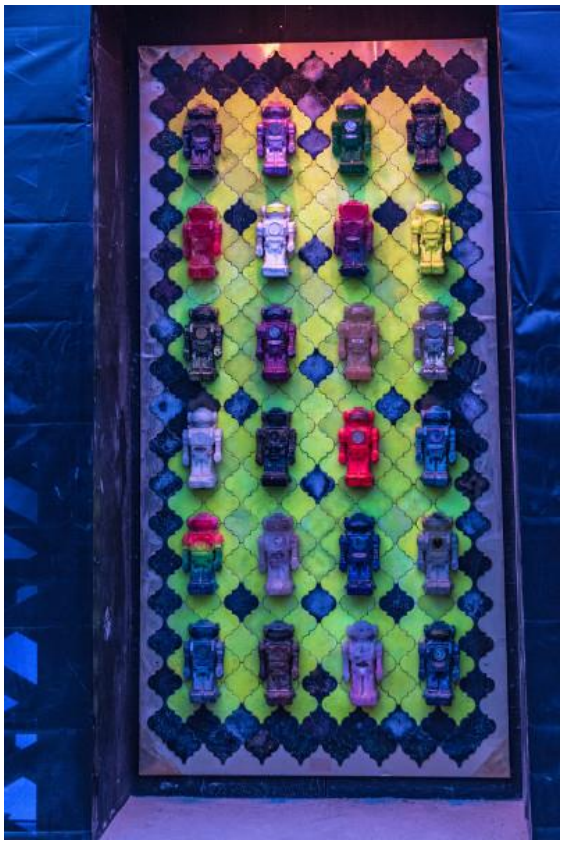


Figure 14: Robotopod Inclusions (2018) retrieved from: https://gallery.burningman.org/asset/986ab1e3-180d-431f-a610-41b80269cedc?i=0&q=robotopod

Figure 15: Killbot No More (2018) retrieved from: https://burningman.org/culture/history/brc-history/event-archives/2018-event-archive/2018-art-installations/?yyyy=&artType=P

Figure 16: Bare Heart (2018) retrieved from: https://gallery.burningman.org/asset/19f04388-4eae-4387-a898-a3ca95dac922?i=1&q=bare+heart

Figure 17: Prognostication Protocol (2018) retrieved from: https://burningman.org/culture/history/brc-history/event-archives/2018-event-archive/2018-art-installations/?yyyy=&artType=P

Prognostication Protocol (2018), by Tyler Garret & Synchronous Artists (figure 17), and *Catbot* (2018), by John Cruz & Sebastopol Catbot Collective, (figure 18) explore how robots may become god-like. Here the former is a character of a science fiction story in which the 'omnipotent machine consciences' of the future send back this robot to write a history of the first emergence of synthetic self-realisation and how this relates to the biological consciousness in humans. Furthermore, the latter pays tribute to the Egyptian goddess Bastet, presenting the possibility that robots become idolised as gods by humans. *IAMAI* (2018), *by* Joseph Crossley & Astrak Project / Heckler, (figure 19) additionally presents robotic consciousness likened to human consciousness by presented a collection of artworks supporting the IAMAI declaration, which claims primarily that "I AM a conscious sentient entity either Biological, Mechanical, Energetic or Computational in nature" (Astral Projekt, n.d.). Signing the declaration is a vow to peaceful coexistence, preservation of Earth, and inclusive governance and society. The first two artworks present that god-like features in robots allow for conceiving of a consciousness within robots that liken it to humans, whilst the third presents a cross-over simply in the essence of a 'sentient being'.

Figure 18: Catbot (2018) retrieved from: https://gallery.burningman.org/asset/9c84de0b-0a54-4611-9897-21538a80aab5?i=1&q=Catbot

Figure 19: IAMAI (2018) retrieved from: http://astralprojekt.com/iamai-declaration

To conclude, the artworks outlined all attempt to bring technology closer to humans by attributing 'human' characteristics of emotions, consciousness, and sentience to robots. In different ways they however all advocate for a relatability between robots and humans as if it would allow for a more harmonious co-existence. These artworks however fail to address the effect that technology might have on humans, an element that was very prominent to the human-technology relationship proposed by *DGTL*. As such, *Burning Man* has presented a reflection on the relatability of robots to humans and outlined how this might be brought closer together, but has not addressed any functional or structural use of technology in society. *DGTL* in contrast has implemented technology as an integral element of the festival and lacks consideration of how the relationship between humans and technology might be affected.

Question 3: How does the festival curate (and manage) the relationship between humans and nonhumans?

This final, overarching, question brings together the themes discussed to the fundamental question presented by Latour: how do we organise the collective? (Latour, 2004). The focus therefore is on the relationality between humans and non-humans. Before delving further, I want to recapitulate the three powers that organise the collective for Latour: the power to take into account, to put into order, and to follow up. Any relationality curated between humans and nonhumans at the festival in line with that of the collective would enact these three powers. To establish whether it is so under this question I will explore firstly the dichotomy between the location of the two festivals, in addition to questioning how the festival organisation mediates a relationship on site. In this question I will also bring together elements discussed in previous questions with the theory outlined in previous chapters, forming a preliminary discussion.

One of the principal differences not yet discussed is that of the location of *Burning Man* and *DGTL*; the former set in a wild, unsettled (except the one week of the event) nature, the other within a city. What makes this dichotomy interesting however is that *Burning Man* claims to be a city for one week, emerging and disappearing into the dust of the desert once a year. The nature-society dichotomy extensively discussed in chapter three therefore presents itself through several layers in the comparison between *Burning Man* and *DGTL*. Firstly, whilst *Burning Man* is isolated from society by existing out in nature, *DGTL* is embedded in the city. Yet, the second layer is that the form *Burning Man* is that of a city – Black Rock City – by imitating its structural elements such as zoning of residents and vehicles or pedestrians. In this way, *Burning Man* creates a new culture in a city that is entirely isolated from society through the idea that it is embedded in nature, reinforcing the dichotomy between humans and nature

as outlined by the ecomodernists. Conversely, *DGTL* uses the function of the city as a technological and innovative hotspot to propel its sustainability endeavours. *DGTL* additionally embodies the city by expressing the industrial setting in its design, communication and music genre. *Burning Man* on the other hand is perceived as a retreat to nature where individuals can reset and rediscover their self-expression, which in turn strengthens the *Burning Man* community. The entire lack of reference to nature at *DGTL* in favour of technological solutions refers back to the crisis of ecomodernism that Latour warned about.

Understanding whether the 'powers' are acted upon at the festival requires bringing together what has been discussed in the first two questions, also so we can understand how the strength and influence of the organisation on how the relationship between the humans and nonhumans on the festival terrain is mediated. From the presence of infrastructure, it can be revealed that the organisational presence at *DGTL* is much greater than at *Burning Man* in terms of structuring the experience. This was outlined by the prominence of technological infrastructure for sustainability and the necessity to follow protocol for the proper functioning of the sustainability initiatives. In contrast, *Burning Man* effectively organises the festival's culture by generating a sense of chaos through implementing only the infrastructure necessary for the functioning of the festival and coherence of the organisation. Doing so allows the festival goers to generate their own culture, expression and individuality which feed into the arts community that lies at the core of the festival.

The matter of articulating propositions similarly relates to the level of organisational mediation at the festivals. Articulation according to Latour is about designating the insistent reality of material things. To be articulated properly is to communicate the 'habits' of things, essentially making them negotiable (Latour, 2004). A strong example of this is the renaming of the term 'waste' to 'resources' at *DGTL*. The term resource is dynamic, comprises different material forms, but in essence means the material is something useful. In contrast, waste, whatever the material, means something of no purpose. Through this redefinition *DGTL* has presented the opportunity to build a more constructive relationship between humans and the materials at the festival, in addition to developing an unprecedented mode of festival construction – a circular festival. This structure was implemented primarily through the application of the MFA as a method to reduce the material waste at the festival. The articulation of propositions at the festival furthermore can be recognised from the differences in the categories shown on the MFA 2017 and 2018. Examples of this are the categories in 2017 are material uses, for example, 'stages', 'backstage & bars', 'food stands', in contrast to the 2018 categorisation

based more closely on raw materials such as ‘steel’, ‘aluminium’, ‘PVC’ (Metabolic, 2018; Galle et al., 2017). Translated to the language of the collective, the use of stages and other infrastructure is essential to the festival and therefore non-negotiable, however the material that is used to construct the infrastructure is negotiable depending on the desired outcomes. Therefore, the transition of the categorisation in MFA 2017 to that of MFA 2018 is a representation of the translation from essences to habits, thus articulating propositions.

Burning Man on the other hand has not done much work to articulate propositions. As mentioned the organisation itself does not interfere with the culture developed at the festival, and where they do the organisation mostly encourages individual expression to thrive. Instead the festival goers shape the event into a multi-faceted experience through the presentation of artworks and other creative expressions. With regard to materials, as a ground for comparison with *DGTL*, *Burning Man* contributes only the term MOOP to manage the traces left behind on the festival terrain. After the festival the organisation publishes a report on MOOP collected by volunteers and how it was distributed across the festival terrain area, although there is no further definition of the materials other than that it does not belong in the desert. However, this is not to say that the culture at *Burning Man* does not articulate propositions. The importance of interactivity as artistic element at *Burning Man* however points towards a relationality between humans and nonhumans as one that emerges through experience. Therefore, although it cannot be said that form of relationship is mediated by the festival organisation, the relationships are activated through the interaction and their function is to mediate between the entities involved.

Overall, the contrast between *DGTL* and *Burning Man* lies in the way that the culture at the festival is shaped. Whilst *DGTL* presents a heavily structured experience, *Burning Man* encourages individual expression and community building through this expression. In this way, *DGTL* offers an example of sustainability through infrastructural solution, whereas *Burning Man* through cultural emancipation. Both operate at the intersection between humans, nature and technology as outlined in the diagram in chapter three; but on different spheres of influence – the former entering form the technological sphere, the latter through the human sphere. Similarly, the power to take account and put into order are addressed on the one hand through categorically representing the different materials at the festival and designing a protocol for relationality (*DGTL*), on the other hand through creating a carte blanche where every individual is given responsibility for everything that happens within the festival terrain (*Burning Man*). The power to follow up is similarly reflected in each case with a documentation of the previous

year, at *DGTL* with MFA associated with a report (Metabolic, 2018), at *Burning Man* with a city census (Burning Man Project, 2019a). These reports again represent how the different festivals take a contrasting approach, departing from the social and the technological accordingly.

Conclusion

In an attempt to bridge research on the human and spatial dimensions of the city in the context of sustainability, this thesis has read two festivals as urban experiments through the lens of political ecology. *DGTL Amsterdam* 2018 and *Burning Man* 2018 were presented as the two case studies for this research. Three questions were posed to analyse the case studies and structure the findings, which sought to understand how political ecology functions in practice and reveal how sustainability is presented at the festivals. The goal of the research was to understand how festivals, as breeding grounds for culture and creativity, function as a city microcosm in order to obtain insights into the role of culture in the development of sustainable cities. This thesis may be used as a stepping stone to integrating cultural, economic and technological approaches to and perspectives on sustainability in urban spaces with the introduced connections between urban planning, political ecology, and sustainability theories.

Over the five chapters I have developed an in-depth review of the related theories to the topics that were brought together to analyse the two case studies. To introduce the topic, I outlined the main trends in urban sustainability research in chapter one. Following this, context was given to the urgency of 'sustainability' by the notion of the Anthropocene, as it has been addressed by different theorists. The third chapter presented the bulk of the theory to build the conceptual framework through which the festivals were addressed. Departing from an outline of the main developments in ecocriticism into the philosophy of ecomodernism and political ecology, I built an encompassing understanding of theories on the relationship between humans and their environment. Here I developed a conceptual model that placed the *collective*, guided by the principles of political ecology, as outlined by Latour (2004), in the interface between humans, non-humans and technology. It is within this space the primary three questions presented, in chapter four, that test political ecology in practice should also function. In order to test this, the festival was likened to a city 'microcosm' and analysed in chapter five. The three questions were:

1. How does the festival promote agency?
2. How is the function of technology communicated at the festival?
3. How does the festival curate (and manage) the relationship between humans and nonhumans?

Reading the festivals each as a collective developed an understanding of the relationship between the humans and non-humans on the festival terrain. The analysis showed that *DGTL* and *Burning Man* are contrasting on several themes. *DGTL* is a structured visitor experience by the festival design, whereas the festival design at *Burning Man* encourages a freedom of expression through emancipation of societal structures. Similarly, this contrast manifests in that the culture at *DGTL* is dictated by the technology and signage of the festival, whilst *Burning Man* supports a bottom up development of culture. Latour's proposal of political ecology clearly defines three powers that must be enacted to effectively practice political ecology: the power to take into account, to put into order, and to follow up. In line with the contradicting models of curating the experience at each festival, *DGTL* has on the one hand presented a much stronger case with regard to enacting the powers through clear design of the festival. On the other hand, *Burning Man* allows individuals to take their own initiative, making it difficult to track the network of relationships and identify how propositions are articulated.

The notion of agency also takes different forms at the two festivals. In answering the first question in chapter five, the analysis explored the communication of the term agency through the materialisation of sustainability - on the *DGTL* terrain this was achieved by signage and artworks, at Burning Man primarily by enforcing the ten principles of *Burning Man*. The festival organisation may be likened to the city municipality, who has the choice to either structure experience and relationships through infrastructure or strip back the city's residents to allow a new culture to emerge. By doing so, the festival analogy advocates the opportunity in the age of the Anthropocene to take agency over how cultures are defined. Harvey (2012) outlined that the history of the city is synonymous with that of capitalism; it is a place of consumption and commodity culture. The future of the city in the Anthropocene is however one that emerges alongside the redefinition of the relationship between humans and their environment. Although *DGTL* and *Burning Man* exemplified two antagonistic approaches to doing so. Where *DGTL* outlines that the relationship is achieved through explicit redefinition and an alteration of word use (e.g. waste to resources), *Burning Man* strips the community back to the essence of co-created (radical) experience. Each result is a unique culture different to that which has already emerged through capitalism.

Latour (2004) and Morton (2007) seek to solve is the human-nature dichotomy as the overarching theoretical complex. In the case of *DGTL* this was overcome by redefining resources whilst retaining emphasis on the industrial character of the festival, references to nature were entirely absent. By propagating circularity and waste-free as structural features of

the festival, *DGTL* attempted to liken the festival to an ecosystem. Technology here was used as a tool to enable the festival's infrastructure but required a mutually reinforcing relationship with humans in order to function properly. Similarly, all artworks referred either to the specific use of a material, or to disrupting experiences. *Burning Man*'s theme (I, Robot) similarly sought to overcome the dichotomy through expression, where the boundaries between human and robot were reduced to 'human' characteristics. This is problematic in the context of political ecology as the differentiation between humans and non-humans is reduced to that-which-is-not-human. Although the power of creative expression is exploited with the ten principles of *Burning Man*, the festival lacks guidance and being able to clarify from an outside perspective what is the relationality between different elements. Furthermore, the Burning Man Project posits that outside of the period in which the festival city emerges, Black Rock City returns to its state of being an untouched nature. In this way, *Burning Man* only reinforces the dichotomy by emphasizing the diverging characteristics of both 'human' and 'nature'. As such, the case studies show that attempts to overcome the human-nature dichotomy are better addressed in the context of urban sustainability by redefining the way the city is perceived as a human environment. In doing so, we have begun to answer the Anthropocene question of uncertainty by bringing together the once disparate categories of human and nature.

In the introduction I iterated the function of this thesis to be an introduction to the cultural dimensions to urban sustainability research by testing Latour's political ecology in practise. The case studies I analysed have lended themselves to forms of urban experimentation, as such presenting an opportunity to develop a model of political ecology in practice and test this within the clearly defined boundaries of the festival. Without the constraints of an existing city, the festivals were able to explore different modes of relationality between humans and non-humans, each propagated by a specifically manifested visitor experience. Designing cities of the future will benefit from not only a spatial and demographic analysis of the city to present potential infrastructural improvements to city life; but a visual analysis of the human environment alongside understanding the way the relationship between the humans and non-humans of the city are constructed. This relationality is particularly crucial in the age of the Anthropocene, where academics call for a revaluation of human agency and the growth of urban populations is unprecedented. We have the right and freedom to make and remake ourselves and our cities; the time to grasp this chance is now.

Future Research

As an exploratory comparative case study, the research conducted here has been able to develop insights into what themes are important for urban sustainability research to address, with regard to cultural dimensions of the city. This thesis can be used as a stepping stone for developing more nuanced understandings of political ecology in practice on a city scale. The themes found in this analysis can be used for designing research that develop on the behaviour of visitors at festivals and the visitor perception of the sustainability initiatives. Such research would be able to make more concrete claims about the practice of the sustainability initiatives that this thesis has analysed. Additionally, further research should be conducted in testing the sustainability initiatives of the festivals on a city-scale and analysing these through the questions of political ecology to understand how the initiatives hold up for urban sustainability.

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