Storytelling in the Anthropocene

A critical consideration of the Anthropocene using socio-ecological theory and science fiction to scrutinise current and envision future stories of social justice and ecological sustainability

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Abstract:

We now have entered the Anthropocene. Humanity is the new geological force drastically changing the systems of the Earth. At least this is the story told by natural scientists. Social scientists are critical of this 'natural' narrative as it cannot deal with the social dimension of geological changes. This is problematic with regard to understanding the relation between social justice and ecological sustainability. Nor are modern social sciences appropriate to deal with questions in which the social and the natural are intertwined. Alternatives are there. New streams of socio-ecological theories have evolved over the last decades all with their own (hi)story of the Anthropocene.

I scrutinise the relations among human biology, social injustice, environmental destruction, artefacts, and human consciousness in the 'natural', posthuman, and eco-Marxist narratives of the Anthropocene. I evaluate the different perspectives and their ability to contribute to social justice and ecological sustainability by making an explanatory critique. This enables me to make the normative judgement that eco-Marxism, due to its clear political program, focus on macro-structures and, to a certain extent, acknowledgement of human exceptionalism, might be most incisive for understanding the relation between social justice and ecological sustainability. I then delve deeper into plausible alternative societies with more justice and ecological sustainability by conducting an ecocriticism of science fiction utopias, using Ursula K. Le Guin's novel *The Dispossessed: An Ambiguous Utopia*. Through a re-imagination of different societies (Urras and Anarres) I suggest that an ecological revolution (in Carolyn Merchant's sense) has taken place on Anarres, and demonstrate how a certain worldview can contribute to social justice and ecological sustainability.

Overall, this thesis explores the role and responsibility of social scientists in the Anthropocene with regard to social justice and ecological sustainability, and hope that through envisioning alternative societies we may take away some of the fear to step out of the modern story, which is likely to reinforce social injustice and environmental destruction.

Keywords: *Anthropocene, social justice, ecological sustainability, socio-ecological theory, eco-Marxism, posthumanism, science fiction, utopia*

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"If there is no alternative there is fear to step into it" — (Schneider 2015)

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Preface

"I'll make my report as if I told a story, for I was taught as a child on my homeworld that Truth is a matter of the imagination. The soundest fact may fail or prevail in the style of its telling: like that singular organic jewel of our seas, which grows brighter as one woman wears it and, worn by another, dulls and goes to dust. Facts are no more solid, coherent, round, and real than pearls are. But both are sensitive.

The story is not all mine, nor told by me alone. Indeed I am not sure whose story it is; you can judge better. But it is all one, and if at moments the facts seem to alter with an altered voice, why then you can choose the fact you like best; yet none of them are false, and it is all one story."

(Le Guin 2000 [1969]: 13)

The Anthropocene has not just one story, while simultaneously it is all one story. As Swanson et al. (2015) frame it: "less than one but more than many." Therefore the best thing to do is understand the Anthropocene in its emergence and interpret it as science fiction (Swanson et al. 2015). And this is exactly what I will do.

When I started the *Human Ecology: Culture, Power and Sustainability* Master Program I was asked to introduce a book that inspired me. I choose *The Dispossessed: An Ambiguous Utopia* written by Ursula K. Le Guin in 1974. It was a book my father once recommended me to read. For me this book was just one of the many forgotten books read by the 'older' generation. But it inspired me. During the Master Program I found that the stories of Le Guin were everything but forgotten. Her novels are still highly appreciated by and of great inspiration for many environmental social scientists (Haraway 2015; Swanson et al. 2015; Kallis and March 2014). And so her novels will be of inspiration for me in this thesis. It is precisely stories that are needed to reflect on the Anthropocene at a time when the Anthropocene does not yet have a future, and its historical and current meaning are still contested. Le Guin inspired me to scrutinise stories of the Anthropocene by being a literary anthropologist of a time and place that exists in its emergence and is about to arrive.

Introduction

We have now entered the Anthropocene. At least that is how the story goes. Global warming through anthropogenic influences cannot be denied anymore and the human is the new geological force, drastically changing the systems of the Earth. There is one 'official' grand narrative of the Anthropocene that tells a factual (hi)story[1] and is better known as the 'natural' narrative (Crutzen 2002). Once this narrative gained in popularity, critique came from social scientists who argue that a natural approach is inadequate to deal with the normative questions that are important to get a fuller understanding of the social dimension of the geological changes. They came up with alternative narratives (Haraway 2014; Malm and Hornborg 2014).

Currently there is neither a clearcut answer nor agreement among scientists on when the Anthropocene started and what story needs to be told. Some argue that it should be traced back 5000 years to when humans started emitting greenhouse gases, others point to the Industrial Revolution and the invention of the steam engine for where it all started. Or did it start with Europe's conquest of America that formed the foundations of the capitalist world economy? (Bonneuil and Fressoz 2016: 14-16) There is one commonality between the different narratives and that is that human history cannot any longer be separated from the history of the Earth System (Chakrabarty 2009). Accepting the Anthropocene thus means that understandings of relations between human and nature in modern sciences need to be rethought. What does this mean for the foundations of social theory and the future of societies as we know them today? And will the introduction of the Anthropocene be the start of an ecological revolution (Merchant 1989) in which we change our relationship to nature in its material and ideological dimension?

Critical social theory emphasises the responsibility of science to make society a better place (Horkheimer 1982). The Anthropocene requests social scientists to critically assess how justice, ethics and morality are linked to ecological questions and how this can be improved in societal structures. As scientists are able to tell the story of the Anthropocene *(*Bonneuil and Fressoz 2016), I see a responsibility to analyse current narratives and visualise new stories. Yet it often remains unclear what change or justice means, and stories of alternative societies are still lacking (Schneider 2015).

This thesis has the aim to understand what (hi)story we need in the Anthropocene if the relation between social justice and ecological sustainability is key. It explores the role of science in understanding the Anthropocene with a focus on the leading question of this thesis: *How to understand the relations among human biology, social injustice, environmental destruction, artefacts, and human consciousness?* I explore the relation between these factors from a 'natural', posthumanist, and eco-Marxist perspective to reveal the shortcomings of a naturalist perspective of the Anthropocene in regard to the relation between social justice

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[1] With (hi)stories I refer to the combination of the different narratives of the Anthropocene and its envisioned future stories.

and ecological sustainability, and I try to argue for a desirable alternative regarding the general question of this thesis: *What scientific perspective do we need to understand the causes of social injustice and environmental destruction, and to offer solutions for social justice and ecological sustainability in the Anthropocene?* A second component of this thesis is providing alternative stories by using science fiction novels. In focusing on the relation between the five different factors in the novel *The Dispossessed: An Ambiguous Utopia*, I show how this can serve as a basis for reflection on the prospects of more social justice and ecological sustainability in different societies. This helps me to answer the final question: *How can science fiction utopias help to imagine plausible and desirable alternative futures?*

The still contested meaning of the Anthropocene is what makes it important to right now scrutinise the debate. The (hi)story we choose matters greatly for our future. And it is social scientists that are able to do so. Or as Bonneuil and Fressoz (2016) deservedly ask themselves: *who is actually able to tell the story of the Anthropocene? (*Bonneuil and Fressoz 2016: 44 [my emphasis])

Methodology and methods

This thesis is an inquiry about the Anthropocene in which different perspectives of social science theory are discussed. The aim is to critically scrutinise the Anthropocene story by highlighting the different narratives of the current situation and thinking about its possible future through science fiction stories.

To make my argument I position myself in the tradition of critical realism proposed by Roy Bhaskar. I thus embrace an epistemological relativism combined with a realist ontology. This means that I do recognise that there is a so-called intransitive dimension, but that this dimension is contingent on certain structures and the activation of causal powers (Sayer 2000: 11-15). Using epistemological relativism is important to understand that knowledge is subjective and transitive and can serve as a means for emancipation. To avoid strong relativism in which all knowledge is equally valid, I reject judgemental relativism, i.e. that it is impossible to judge between different types of knowledge as more or less valid (Sayer 2000: 47). I rather assume that social scientific knowledge is able to provide moral conclusions (Benton and Craib 2011: 136-138). Roy Bhaskar (2009 [1986]) his notion of 'explanatory critique' can contribute to this.

Explanatory critique is a method in which values can be assessed via an evaluation of explanations. This means that science does not have to be free of values to be valid (Sayer 2000: 160). Explanatory critique exists of four steps. First, explanations can contribute to a revelation of false beliefs, limitations or unmet needs that, second, can be placed in a certain structure of domination that explains the cause of the false beliefs, unmet needs or limitations that are identified. Thereby, explanatory critique has an emancipatory function as it assumes that 'ought' can be derived from 'is', so that if there are false beliefs then they ought to be changed. Step three, then, is when a negative judgement can be made about the false beliefs embedded in

a certain explanation. The last step is providing alternatives and actions that can help to overcome the problems and false beliefs that are present in a situation (Sayer 2000: 161-162).

In this thesis I offer an explanatory critique of the different (hi)stories of the Anthropocene: to reveal the false beliefs with regard to social justice and ecological sustainability in the different (hi)stories; to identify the context (scientific assumptions) in which they are embedded; to pass a negative judgement on certain perspectives and thus assess normatively which scientific perspective is more conducive to understand the Anthropocene in terms of the relation between social justice and ecological sustainability. To develop an explanatory critique I draw on aspects of different research fields.

First of all components of *the history of ideas* can be found, as it inspired me to reveal the contingency of the current narratives of the Anthropocene that are based on different perspectives. Therefore I reveal the underlying assumptions of the narratives in light of different scientific theories to show the diversity of the Anthropocene (hi)stories that evolve together with and alongside each other. Or as Foucault articulated it:

> "In short, the history of thought, of knowledge, of philosophy, of literature seems to be seeking, and discovering, more and more discontinuities, whereas history itself appears to be abandoning the irruption of events in favour of stable structures."
>
> (Foucault 1972: 6)

These seemingly stable structures are problematic in the light of *critical theory*. Elements of critical theory are a second aspect which can be found throughout the thesis, in which science is understood as having ethical responsibilities to question the status quo, and aims for liberation of the subjected (Horkheimer 1982; Haraway 1991). I draw on posthumanism and eco-Marxism, as they are both influential in thinking about environmental problems among green and left social scientists focusing on emancipation and questioning status quo (Castree 2002).

Focusing on the relations among the five factors listed above, I scrutinise the 'natural', posthuman, and eco-Marxist narratives with regard to social justice and ecological sustainability. I analyse how they are embedded in a particular ideological basis and established in a historical context. This enables me to reveal the blind spots of the natural narrative with regard to the relation between social justice and ecological sustainability. For this reason it is important to understand the differences between eco-Marxists and posthumanists to remain critical towards the alternative narratives that are provided to the natural narrative, instead of just taking them for granted as if they provide complete correctives to the shortcomings of the natural narrative. Also by understanding the different assumptions of these two influential schools of thought, I try to analyse how each of them can contribute to social justice and ecological sustainability in the Anthropocene. This enables me to assess what perspective is most useful with regard to these values.

Steps 1 to 3 of the explanatory critique are conducted through a literature review. The final step is to propose better alternatives, as the underlying aim of an explanatory critique is to contribute to a transformation of the social practices that are questioned (Stahl 2013: 7). Only understanding the limitations and misconceptions, combined with a claim to resolve them, does not contribute to the feasibility of creating a better alternative. This leads to a next question what 'better alternatives' are — in this case societies with more social justice and ecological sustainability.

Within critical realism society is approached as an open system, assuming that what will happen is contingent. This means that its future cannot be predicted.[2] This does not mean that there is no possibility to think of what societies with more social justice and ecological sustainability can be and what is needed to create them — the so-called activation of causal powers in a certain geo-historical context in terms of critical realism. To make sketches about desirable and plausible future societies without claiming them to evolve exactly like this, simply because of the impossibility of it, I follow the argumentation of Sayer that: "Even if actual examples of similar practices are not available, conducting thought experiments and asking counterfactual questions is at least better than leaving alternatives unexamined" (Sayer 2000: 162).

Science fiction novels might provide a solution. The science fiction novels of Ursula K. Le Guin are described as 'critical utopias' by literary critici. A critical utopia has not the aim to create a sort of perfect society, but is rather a tool to critically question society with the aim to morally and ethically improve it (Burns 2008: 2-3). Utopias are more than just narratives, they can do what a narrative cannot: they can come up with new stories. "Utopian visions that include those of the past, and modify and correct them" (Jameson 2007: xv). Telling stories is important as I believe just as Haraway does that, *"stories are much bigger than ideologies. In that is our hope"* (Haraway 2003: 17 [my emphasis]).

To bring about new stories of the Anthropocene I conduct an 'ecocriticism' of the science fiction novel *The Dispossessed: An Ambiguous Utopia*,[3] written by Le Guin in 1974. Ecocriticism is the study of literature that analysis the place of nature and humans given in it. Ecocriticism has the moral and political aim to create awareness of naturalisations and consequences of relations between humans and the environment (Garrard 2012: 2-5). It is a tool to reimagine society in order to change the ideologies of a certain culture (Clark 2015: 19). Through exploring and defining ecological problems in stories, ecocriticism can evaluate how useful a certain response to the environmental crisis is and can open up the debate between different environmental perspectives (Garrard 2012: 4-6). Delving into Le Guin's science fiction world, I explore what sort of society,

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[2] Within a critical realist approach reality should be understand through the activation of certain mechanisms dependent on causal powers and takes place in a certain geo-historical context and therefore the outcome is always contingent (Sayer 2000: 15).

[3] To which I from now on refer to as *The Dispossessed,* leaving out the subtitle.

based on which assumptions and beliefs, can be desirable in the age of the Anthropocene as an alternative to the 'natural' narrative.

Or as Le Guin (1969) once remarked: "[science fiction] is not a prediction about the future as much as it is a thought-experiment about the present" (Swanson et al. 2015: 149-150). An ecocriticism of science fiction literature helps to illustrate the power of literature, and the potential of science fiction in the Anthropocene to envision its future, as the Anthropocene is a story that is in the making and still has to be written.

In drawing on fields such as the history of ideas, critical theory, and ecocriticism, I do not assume an objectivist epistemology, but rather try to reveal the normative dimension of science. The thesis is a critical analysis of the Anthropocene. Despite its critical character, I share the conviction with critical theorists that this thesis should and can contribute more than merely a 'moral condemnation'. It is rather a revelation of certain normalisations and ecological struggles that are present in the 'natural' narrative of the Anthropocene and a critique of its incapacity to think of alternative societal structures (Stahl 2013: 1-2). This normative character of science is important to be able to reveal relations of power and injustice and thereby create awareness. Exposing ideologies, explaining them, making moral judgements, and envisioning plausible alternative futures via an ecocriticism of science fiction utopias help me to make my argument. The aim is to understand and acknowledge different scientific perspectives on the Anthropocene and to find out what knowledge is useful for revealing relations of power and inequality, in order, hopefully, to deliver a small contribution to social justice and ecological sustainability in the Anthropocene.

Limitations

A first limitation can be found in the stories of the Anthropocene I discuss in depth. I only explore a small selection of Anthropocene stories while there are many more stories to tell. For example, the story of post-colonial theory that brings in non-Western scientific perspectives is especially interesting with regard to the Human Ecology program as post-colonial theory is of great importance to the discipline, and, thereby, it focuses on social and environmental justice. Nonetheless, many post-colonial concerns, e.g. environmental justice, world-system analysis, and relations of Otherness, are implicitly embedded in posthuman and eco-Marxist theory. This is not surprising, as anti-colonial thought evolved from Marxist ideas (Chakrabarty 2012) and non-modern understandings of human-nature relations (Vansintjan 2016). However, I decided not to focus on this perspective, as I had become involved in the debate between posthumanists and eco-Marxists and this already filled the available theoretical space of this thesis. Moreover, this debate is quite present in socio-ecological theory and has been influential in the work of environmental social scientists (to mention some: Castree 2002; Soper 2012; Chagani 2014; Kipnis 2015; Hornborg 2017).

Second, *The Dispossessed* is written in 1974 and is thus not a critique of the current societal structures in which the term Anthropocene is introduced. However the societal structures from which the term emerged were already present in the 1970s and are criticised by Le Guin. This makes her novels still of great value to understand contemporary debates. Also in her work Le Guin focuses mainly on social issues and not specifically on the ecology (although ecological concerns are certainly present in her novels). Still I see the novels as helpful to use as a consideration of the Anthropocene for the reason that, from a social science perspective, ecological problems are inherently social. This means that to understand the Anthropocene we have to understand the social relations it is embedded in (Malm 2016: 19, 271-272).

Last, to conduct an ecocriticism is a highly personal endeavour and therefore my own convictions and interpretations influence the analysis. It is I who chooses what to highlight, and which book to examine. This gives me a certain power. Simultaneously this might also be seen as a strong point as I thereby can emphasise what I think is important in the Anthropocene, which I hope to justify by drawing on certain socio-ecological perspectives. When I read the 'Frequently Asked Questions' on Le Guin's webpage and saw that Le Guin answered the question "What themes and ideas recur in your writing?" as follows: "This is a question for critics not for the author" (Le Guin 2007), it encouraged me to continue the ecocriticism.

Structure

To guide you through the different (hi)stories of the Anthropocene I start with an explanation of the official narrative and why this concerns social scientists. Considering that Human Ecology belongs to the social sciences, a first aim in this thesis is to understand why and how social science research is important for understanding ecological changes which at first sight might seem a question belonging to the natural sciences. I give a short introduction to social theory, the emergence of socio-ecological questions, and how this caused fundamental changes in thinking about relations between the social and the natural. Still there is no clear-cut view on what socio-ecological theory is. Different perspectives evolved during the last century, such as posthumanism and eco-Marxism. I will discuss some of the particularities of these perspectives and introduce some scientists who can be assigned to one or the other of the traditions and have theorised socio-ecological questions. Part I provides a brief overview on what socio-ecological theory is and why this is important to understand ecological changes.

Part II takes us back to the Anthropocene and explains how scientific perspectives are linked to specific narratives of the Anthropocene. I will here introduce alternative narratives coming from the posthumanist and eco-Marxist traditions, which challenge the official, 'natural' narrative, explain why it matters that there are different narratives, and reflect on the relative usefulness of each narrative with regard to social justice and ecological sustainability.

Part III is written to explore and envision more or less plausible alternative societies. It introduces the science fiction world of Le Guin and examine the potential of an ecological revolution to establish a society based on an alternative human-nature relationship by analysing the relations assumed to exist between the five factors in different societies, and visualise how Le Guin imagines a utopia based on a particular, desirable worldview.

A focus on the relations among biological, social, ecological, technological, and cognitive factors

Throughout the thesis I reflect on the relations among human biology, social injustice, environmental destruction, artefacts, and human consciousness. This forms the thread of the thesis as I believe that social scientists (and fossil-fuel-burning individuals) have a moral responsibility to contribute to social justice and ecological sustainability. Unfortunately, the Anthropocene is an era of social injustice and environmental destruction. This concerns me and gives me a reason to explore different scientific perspectives and science fiction novels in their explanation on how these aspects are (or are not) related to human biology, artefacts, and human consciousness and how this influences the (hi)story they tell of the Anthropocene.

Human biology refers to "the functioning of the human organism and aspects of the life of human populations such as their ecology, genetics, and epidemiology" ("Human biology" 2016). In this thesis I use it mainly to refer to specific traits of the humans such as its capacity for symbolism, semiotics and language (Hornborg 2015; Castree and Macmillan 2001: 213), but also to human ingenuity and reflexivity (Steffen et al. 2011a) and therefore its ability to manipulate fire (Steffen et al. 2011b).

Social injustice concerns the unequal global processes in relation to environmental destruction (Malm & Hornborg 2014: 63). It includes the "inherent asymmetric nature of climate change" and suffering from environmental destruction (environmental racism), responsibility for environmental destruction and acting against it, and willingness and opportunities to address issues of environmental problems (Roberts and Parks 2007: 31). Social (in)justice in relation to the environmental concerns of the Anthropocene is therefore closely related to environmental (in)justice, i.e. the non-distributional dimensions, e.g. the ability to speak up in climate negotiations or protest against environmental racism, but also the material dimensions of justice such as the devastating consequences of resource extraction for livelihoods (Martínez-Alier 2012).

Environmental destruction refers to the devastating consequences of the human-induced ecological changes that define the Anthropocene (Crutzen et al. 2000).

Artefacts refer to fabrications of humans (see Hornborg 2017 and Ingold 2011: 20-22), which can refer to non-living objects but also to symbolic phenomena such as language or social categories (Latour 2014a: 16). Artefacts are considered in order to understand both how they influence humans and how they are perceived

by them. This influences whether artefacts are of importance as causes of social injustice and ecological destruction and solutions to enhance social justice and ecological sustainability.

Human consciousness refers to "the totality of one's thoughts, feelings, and impressions, the awareness of one's acts and volitions" (Merchant 1989: 19). This can be related to one's worldview which can be based on scientific assumptions (reflected upon in part I and II), but can also be present in religion and mythology or expressed through rituals, songs and culture (Merchant 1989). The latter forms the focus of the analysis in part III. Understanding different worldviews gives insights on issues such as whether we should or should not acknowledge human exceptionalism, and on the relation between human and nature.

The emergence of the Anthropocene

Did we by entering the new millennium also enter a new geological epoch? In 2000 scientists, among whom the Nobel prize winning atmospheric chemist Paul Crutzen, came together to discuss the current state of Earth System. In this meeting concerns were raised about how humans significantly alter key processes of the Earth System and drive environmental changes. The role of mankind is so profound in these changes that Crutzen emphasised that the Holocene is not an appropriate definition anymore for the geological epoch we live in. From now on we live in the Anthropocene: "the age of man" (Crutzen et al. 2000).

The Anthropocene: a 'natural' perspective

The Anthropocene, as the initial and official grand narrative tells us, started in 1784 when James Watt invented the steam engine. Prerequisite for this was the human ability to make fire, which distinguishes humans from other species (Steffen et al. 2011b). Population growth, increase of cattle, exploitation of planet Earth by humans and the great amount of greenhouse gas emissions now have been recognised as destructive forces. Acid rain, smog, and climate warming are just a few aspects of global environmental change due to humanity. In this new era, mankind is the major environmental force. As long as there are no radical changes, humans will continue to be destructive environmental forces and we will exceed the planetary boundaries[4] (Crutzen 2002: 23; Rockström et al. 2009). In this view, because of the reflexive trait of the modern human, scientists raise awareness of the destructivity of human actions on nature (Bonneuil 2015: 21) and argue that, in the Anthropocene, there is a need for human ingenuity and large-scale geo-engineering (Crutzen 2002: 23) to continue on a path of wiser stewardship of the Earth System (Steffen et al. 2011a). This approach can be placed in the tradition of ecomodernism in which "[a] good Anthropocene demands that humans use their growing social, economic, and technological powers to make life better for people, stabilize the climate, and protect the natural world" (Asafu-Adjaye et al. 2015). A just and sustainable society lies at the heart of the global energy economy in which the energy should be provided in abundance by clean technology to

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[4] Planetary boundaries refer to nine boundaries of the 'planetary playing field' that should not be crossed by humanity if we want to avoid major environmental changes on a global scale (Rockström et al. 2009).

alleviate poverty, to decouple human development from nature and "to offer a pathway to the better life" (Asafu-Adjaye et al. 2015).

According to the natural narrative, the relation among the five factors (human biology, social injustice, environmental destruction, artefacts, and human consciousness) would be as follows: the inventive nature of humanity and its ability to make fire is prerequisite to the invention of the steam engine, which is prerequisite for the anthropogenic environmental destruction changing the Earth System drastically. Social injustice is not part of the natural narrative in explaining environmental changes. The way forward in times of the Anthropocene according to the natural narrative lies in human ingenuity, which by means of the invention of technology can save us from devastating effects of environmental changes and, as a positive side-effect, this contributes to social justice. This is an anthropocentric worldview in which there is a belief that *humans control nature*. Even though proponents of a natural perspective acknowledge the interrelatedness between humans and nature in the first place (as this is the new understanding of human-nature relations in the Anthropocene), with regards to solutions they understand humans as living outside a manipulable nature and thereby reinforce the problematic human-nature dualism (Plumwood 2002; Bonneuil 2015).[5]

The Anthropocene: a social perspective

As soon as the Anthropocene concept was introduced, critique came from social scientists.[6] A mere relocation of the concept from the natural to the social sciences is problematic as it neglects the social dimension underlying the environmental crisis and the dimensions of power and culture (Malm and Hornborg 2014: 66). Because natural scientists attribute agency to humanity and argue that human and natural history cannot any longer be separated, they include human history in their narrative while explaining climate change via a natural science approach (Chakrabarty 2012). This depoliticises and naturalises the (social) history that led us into the era of environmental change (Bonneuil and Fressoz 2016: xiv). The natural narrative sketches a story in which the Earth becomes an object that can be governed by knowledge and humans (Bonneuil and Fressoz 2016: 47), in which humanity is framed as if it was a uniform biological species living on a unified global Earth (Bonneuil 2015; Haraway et al. 2015: 5-6).

Neglecting the social dimension of climate change has the danger to reinforce social inequality and dislocation of the distribution of environmental gains and burdens that need to be understood if the aim is to contribute to more just societies (Roberts and Parks 2007). Socio-ecological asymmetries such as the unequal

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[5] The human-nature dualism and why this is problematic will be discussed in section *1.1.1 Human-nature dualism*.

[6] Important to take into account is what criticism means. It does not mean that by critically assessing the different narratives, and especially the natural narrative, means that all their findings are invalid or unimportant. It rather aims to show different perspectives and thereby brings the Anthropocene and its future in discussion. A discussion in which a desirable era of ecological sustainability and social justice can be envisioned, rather than taking a technocratic and neoliberal solution for granted (Bonneuil and Fressoz 2016: 49).

social, racial, gender and geopolitical relations that govern the Anthropocene are not only situations of injustice, but also inadequate to assure long-term and/or global ecological sustainability[7] (Bonneuil 2015: 20; White et al. 2016: 98).

Besides all the critique social scientists raised, the Anthropocene is also welcomed as an opportunity amongst some of them. They feel acknowledged in their arguments that the human-nature dualism is obsolete and see potential to abandon the categories of human and nature (Haraway et al. 2015: 1; Latour 2014b: 138-139), to get rid of the separation between natural and social sciences (Tsing et al. n.d.), and to realise 'desirable and plausible futures' (Bai et al. 2015).

The natural sciences lack the analytical tools that are developed by the social sciences to understand the subjective dimension of environmental change (Hornborg 2017: 6). In the naturalistic history of the Anthropocene humanity is taken into account through a descriptive and quantitative analysis. This means that the interconnection between human action and environmental change is underpinned through measuring, modelling and testing human activities — such as increase in population, agriculture, deforestation and GDP (Bonneuil and Fressoz 2016: 69). These insights can tell us a great deal about the new reality of environmental change but are inadequate to deal with the societal consequences or power relations and driving forces of these changes (Palsson et al. 2013: 7). Social scientists therefore argue that to fully understand the relation between humans and the environment it is also important to understand the ideological systems, institutions, relations of power, and technological and economic processes (Bonneuil and Fressoz 2016: 44). However, modern social science is not enough, as the focus on ecological processes has been limited. The Anthropocene is in need of a new collaboration between the natural and social sciences to get a better understanding of the socio-ecological processes that shape the biosphere.

Part I: Socio-ecological theory

1.1 Problems with modern social theory
Modern social science has its roots in the intellectual optimism of the Enlightenment in which reason and objective science are fundamental to gain universal law-like knowledge that will lead humanity to progress (White et al. 2016: 18). Modern social science was divided between the natural and the social dimension. Nature, external to society, is determined by natural laws, whereas society and culture belong to human history. In the Anthropocene scientists realised that natural and human history could no longer be understood as separate realms. They are rather deeply intertwined (Hamilton et al. 2015: 5-6; Chakrabarty 2009: 201-207).

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[7] This has to do with an unsustainable social metabolism as will be explained in section 2.5 and Georgescu-Roegen's analysis of the Second Law of Thermodynamic (the Law of Entropy) and the ecologically unsustainable character of economic growth (Foster and Burkett 2008). This analysis, however, is beyond the scope of this thesis.

The demarcation of social theory to either the natural or the social realm is present in modern social theory of the last 200 years. Social theory could roughly be distinguished into two extremes. There was social theory that understood social life from a natural reductionist perspective (natural materialism and a realistic ontology) in which the social is shaped by natural forces. This perspective is criticised for its lack of attention to the social dimension (White et al. 2016; Plumwood 2002). As a reaction to this, the constructionist perspective developed. This perspective challenges the materialist ontology by emphasising that the social cannot only be explained from natural contexts (Descola and Pálsson 1996: 11). The constructionists argue that discourse and culture determine everything that can be known. In this they adopt a relativistic ontology (White et al. 2016: 17). Constructionism, however, is criticised for its sociological determinism and idealism by denying any influences of the biophysical processes on social life. To constructionists nature is nothing more than textual (White et al. 2016: 9-11). Both objectivism and relativism are regarded as unable to understand socio-ecological processes because of their strict separation between the natural and the social. Modern realists base their knowledge production on representing an object out of its context, whereas constructivists deal with the constructing subject. They thereby do not take the recursive relations between subject and object into account in their scientific inquiries (Hornborg 2014: 125).

1.1.1 Human-nature dualism

In the Anthropocene it is acknowledged that the subject (human) and object (nature) are not developing in two different realities, but that the two are instead entangled (Swyngedouw 1999: 445). This means that relations between the subject and the object (or relations between humans and their environment or society and nature) can neither be understood through traditional realism nor through constructivism, because of the ontological separation between the object and subject that is assumed in both these traditions. This ontological dualism belongs to the modern, humanistic science in which myth, religion, and superstition can be revealed via rationality (Castree 2001: 4, 6; Harvey 1990: 12) and is not generalisable over different cultures (Hornborg 1996: 56). It is rather an ideology that required legitimacy through Descartes' philosophy and has been the foundation of western cosmology (Descola 1996: 97). The ontological dualism between humanity and nature is often criticised[8] as problematic because it implies a hierarchical relation between the two. In modern social theory this is conceived as a relation between the active human subject that stands above and is situated outside a passive and objective nature, on which society is built. The human-nature dualism ascribes control and independence of nature to humans (Plumwood 2002: 4). This is problematic for various reasons: it justifies the instrumental use of nature by humans (Soper 1995: 23), and the inclination toward objectification — a consequence of the Cartesian dualism in western science — leads to a

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[8] There exist different critiques on the ontological dualism between the social and natural, other concerns and perspectives on this issue will follow throughout the thesis.

decontextualisation of social relations and serves as a source of power, repression, and exploitation (Hornborg 1996: 51).

Conventional modern social theories are thus limited when it comes to fully understanding the entanglement between subject and object (Palsson et al. 2013: 9). If the natural and social should not be integrated by explaining the social via natural concepts or understanding natural processes as merely social concepts, how then can the relation between the two be understood? (Descola and Pálsson 1996) A need for new social-ecological theory has arisen.

1.2 The integration of ecological questions in social theory

Socio-ecological theory of science is needed to understand the social particularities and normative dimensions of ecological questions such as race, justice, ethics, and power (White et al. 2016: 5-7; Garrard 2012: 6). Since the beginning of the 20th century the relation between the social and natural was already acknowledged in some social theory, but it was not until the late 20th century that socio-ecological relations gained major relevance within social science theory (White et al. 2016: 2, 28). This is not surprising, as this dualism forms the foundation of modernist social theory. A rejection of the dualism, therefore, requires an entirely new perspective in social theory (Descola and Pálsson 1996: 12), while, on the other hand, the dichotomy between nature and culture has been proven to be quite useful as well (Descola 1996: 83).

1.3 New theories for understanding socio-ecological processes

Social scientists have started to develop new theories to understand society in terms of its entangled social, ecological, and material dimensions. The Anthropocene has prompted us to acknowledge that natural and human history are inseparable. This has led to an increase in social science research that indicates that environmental problems are inherently social and cannot be separated from their socio-historical context, relations of power, social institutions, and inequality. However, these evolving socio-ecological theories are not in agreement on how these relations are to be conceptualised, or how specific socio-ecological relations are constituted (White et al. 2016: 2).

Two perspectives that have evolved in social science theory that deal with this topic are posthumanism and eco-Marxism. When it comes to understanding socio-ecological relations and agency, however, these schools of thought are incommensurable. Posthumanism challenges the humanist tradition and rejects any separation between human and nature. Critics argue that it cannot deal with relations of power or responsibility and instead tends to legitimise inequality (Hornborg 2017). Eco-Marxism, on the other hand, specifically scrutinises relations of power. But can human-nature relations only be reduced to power? Does this do justice to the complex relationship between human and nature? (Chakrabarty 2015: 41, 49; Stengers 2015: 141-142)

1.3.1 Posthumanism

Posthumanism is a scientific field that emerged as a reaction to humanist scientific traditions in which humans are placed at the centre of things and distinguish themselves from other entities (Badmington 2004: 1345). Rethinking relations between humans and non-humans is central to posthumanists. Instead of making clear distinctions between the two categories, they argue that the demarcation between the human and non-human is obsolete (Soper 2012: 367).[9] The ontological distinction between seemingly natural categories, such as the organic versus the inorganic, are rejected by posthumanists and considered as existing in ontological continuity (Soper 2012: 368). Instead of understanding entities as entirely social or entirely natural before they interact, posthumanists argue that the world is full of hybrids that are outcomes of "not quite natural, not quite social entities" (Castree 2002: 118). A second feature of the posthumanist tradition is the attribution of agency to non-humans. They thereby erase the difference between the agency of humans and that of non-humans (Kipnis 2015: 44). Posthumanists argue that acceptance of this ontological standpoint and the downplaying of different types of agency, can challenge relations of domination. In this view, these are steps towards emancipation of the oppressed (Haraway 2003; Soper 2012: 368).

1.3.2 Eco-Marxism

Eco-Marxism is a political and radical scientific field that questions cornucopian ideas of capitalist production systems. Eco-Marxists reject the idea of ecocentric monism. They approach humans as being part of nature but also acknowledge that humans generate 'unnatural' phenomena. Instead of adopting either a monist or dualist position they embrace a dialectical, historical, materialist perspective (Foster et al. 2010; Garrard 2012: 32). A dialectical perspective understands 'things' as processes and relations that constitute systems. These things and systems are determined by the relations between them. However, this does not mean that the system, the whole, is merely a sum of its parts (the things) that exist separately from each other and come together to constitute the whole. Things or systems cannot be understood outside their relations, and can undergo change. What is meant by this, becomes clearer through understanding the difference between, on one side, the Cartesian observation that there are things that have a history which is not part of the nature of the things, and on the other side, the Marxist understanding that history is not static and separated from the current state of things, but rather fluent and part of the momentary nature of things. Things therefore have a transient character, and their appearance of permanence — i.e. the concrete material dimension of the world that seems to be the permanent basis of power — is dependent on historical processes of material relations (Harvey 1996: 55-62).

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[9] I refer to Kate Soper because of her clear description of posthumanism, but Soper herself does not belong to the posthumanist tradition.

1.4 Bringing literature alive: the debate between posthumanists and eco-Marxists

Eco-Marxism belongs to the humanist tradition of science. Posthumanism, as the name already indicates, looks for something that goes beyond the humanist tradition. But should this prompt us to "throw out the baby with the bathwater" by rejecting any separation between humans and nature? (Hornborg 2017: 8).[10]

1.4.1 Humans, non-humans, and agency

Posthumanists would say yes. They argue that we should get rid of dualisms that belong to modern western science. Latour for example argues that "Nature and Society have no more existence than West and East" (Latour 1993: 85) and sees no use at all for the distinction between the 'natural' and 'non-natural' (Latour 2015a). The separation between nature and culture, according to Latour, is created by modern science, in which we try to find explanations of 'matters of fact' by adding reality to things, or subtracting reality by deconstruction (Latour 2015a). To explain the 'Amodern' position that Latour takes, he refers to the problems of the 'Modern Constitution' that is built on the false foundations of the humanist tradition in science. In the Modern constitution non-humans belong to the realm of science and humans to the realm of politics. This means that in the Modern Constitution a distinction is made between the scientific power that represents objects and the political power that represents subjects. These two spheres should no longer be separated as they enfold together and reinforce each other (Latour 1993: 28-31). What science should rather deal with are 'matters of concern' — the distribution of agency that is dispersed over networks which enfold through the assembling of living and non-living entities or 'actants'[11] in which hybrids enfold (Latour 2015a).

Andrew Kipnis, who acknowledges posthumanism to a certain point, is critical towards the downplaying of all differences in agency between humans and non-humans, as it cannot deal with questions of global inequality (Kipnis 2015: 43-44). Fayaz Chagani confirms this and argues that posthumanists who reject the analytical distinction between humans and non-humans disregard the responsibility of humans. They thereby deny the tools and strengths of political ecology and eco-Marxism to reveal power relations (Chagani 2014: 433) and so reduce the emancipatory potential of posthumanism (Gareau 2004: 1). Alf Hornborg retains the analytical distinction between humans and non-humans. He argues that to understand subject-object relations we should start from a political economic standpoint to unravel how agency is delegated to non-humans instead of abandoning all the differences between subjects and objects, which would obscure the social relations and historical transformations that are prerequisite for an artefact to have agency (Hornborg 2015:

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[10] Within eco-Marxism as well as in posthumanism there is no clear-cut understanding or ultimate agreement of what the foundations of these scientific traditions are. Instead of providing one ultimate definition of both traditions I will present an overview of different thinkers who can be placed in one or the other tradition.

[11] Within ANT the term 'actant' is preferred to 'actor,' as actor tends to connote the human capacity to act, deriving from its intentionality and language, while the difference between humans and non-humans are downplayed within ANT. Using the term actants refers to agency that is relationally constituted in networks rather than pre-given and thus can vary between different situations (Castree and MacMillan 2001: 213).

36). So instead of attributing autonomous agency to inanimate entities, Hornborg refers to the Marxist position that this agency should be seen as fetishism and the mystification of relations of unequal exchange. In doing this he distinguishes himself from the posthuman tradition and talks about artefacts having *consequences* instead of agency (Hornborg 2017). Within the Marxist tradition, the aim is to reveal the agency that is attributed to an artefact, when this apparent agency is an illusion produced by particular relations of unequal exchange.[12] Posthumanists, according to eco-Marxists, who attribute agency to non-human entities reinforce the problem as they confirm, legitimise, and enforce the underlying power relations and unequal exchange which Marxists have revealed (Hornborg 2017: 3).

1.4.2 Questioning grand theories and social processes

Latour, however, is critical towards the Marxist tradition and would argue the other way around. Marxists who preoccupy themselves with revealing fetishism make situations worse. They base themselves on and thereby reinforce distinctions between the material and social to obscure illusions which follow the principles of the Modern Constitution that he so strongly criticises (Latour 1993: 36). The Modern Constitution is built on a double paradox in which denial of hybrids reinforces the intertwinement of nature and culture. The Marxist project of deconstruction and denunciation is unnecessary as, according to Latour, *we have never been Modern*. This means that, if we abandon (false) dualisms in the first place, we do not have to reveal them anymore. Therefore we should rather focus on how hybrids are produced and assembled in networks (Latour 1993: 46-47).[13] Explanations of these networks do not start with categories of nature and society. This can only be the case in the modern perspective and the belief that "Nature and Society allow explanation because they themselves do not have to be explained" (Latour 1993: 80). Starting from pre-established categories is problematic as too much power is assigned to these categories, while they themselves need conjoined explanation that account for their relations with many other entities (Latour 1993: 81).

Posthumanists, following Latour and Actor-Network Theory (ANT), criticise eco-Marxists in their urge to find a grand theory that can deal with nature-society relations. Posthumanists instead adopt an empirical approach in which processes should be understood as networks that emerge in relations. This means that situations cannot be understood as if there are some general factors existing before the network came into being (Castree 2002: 114-119). "It refuses the presumption that *different* networks are driven by the *same* (social or natural) general processes or factors" (Castree and MacMillan 2001: 212 [emphasis in original]). Generalisations and grand theories are therefore inappropriate.[14] Eco-Marxists, according to ANT

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[12] Unequal exchange is a Marxian concept that refers to inequitable processes of material trade (Hornborg 2011: 2)

[13] This is a central point of Actor-Network Theory (see below).

[14] As some critics have observed, this is a paradoxical position inasmuch as ANT itself is built on generalisations. Moreover, it raises questions about whether e.g. the laws of thermodynamics should be dismissed as invalid narratives.

proponents, deny the complexity of situations by referring only to capitalism, capital, or class interests that hold power (Castree 2002: 114-119). Power, according to ANT, is not held by a certain actor or institution but is present as distributed phenomena within networks. This is important, because otherwise power can easily be subtracted from nature by merely understanding nature as an *effect* of power (Castree and MacMillan 2001: 214 [emphasis in original]).

Isabelle Stengers also argues that we should get rid of modernist, human-centred theories. Rather than theorising the past we should focus on the 'historical present'.[15] In this view, the present should struggle to break with the historical modes of classification that established the present. The present should rather be understood through practice, which cannot be reduced to other practices and is separated from general theories (Stengers 2013). This means that social scientists should not be busy discussing and defining capitalism, to which a uniform power is attributed and all problems subordinated. Instead of debunking capitalism and revealing the false illusions in which humanity is stuck, the focus should be on imagining how to defeat 'real consequences' (or 'matters of concern' as Latour (2004) would call them). Power should be given to the humans and non-humans who unfold together in situated and fluent practices. This is what leads to emancipation (Stengers 2015: 141-142).

1.4.3 Capitalism and socionatures

Scholars coming from the eco-Marxist tradition are aware of the necessity of accounting for the intertwining of society and ecology (Harvey 1994; Swyngedouw 1999). Erik Swyngedouw situates himself in the political ecology tradition and draws on Marxist understandings of nature (Swyngedouw 1999: 443-445). Although coming from the Marxist tradition, he also refers to 'hybrids' and 'socionatural processes'[16] and the problems of nature/society dualisms in current understandings of geographical phenomena. Modern socionatures, Swyngedouw argues, are the outcome of dialectical, historical spatial-ecological relations (Swyngedouw 1999: 445) constituted by materialised power relations. These processes can only be understood if knowledge of the laws and balances of nature is taken into account (Swyngedouw 1999: 460). Rather than understanding nature-society dualism as obsolete, because of its undeniable interweaving, he follows the Marxist Neil Smith and his ideas on the concept of 'nature washing' (Smith 2008: 245) to understand the difference between the two categories. Nature washing points to the undeniable social influences on nature and climate, but therefore we cannot deny that it is still the natural processes that challenge the continuation of human societies. Instead of denying the existence of nature, we should rather ask ourselves if the social influences on nature reinforce the existence and causal powers of nature (Swyngedouw 2011: 76).[17]

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[15] Stengers is in this argumentation inspired by Foucaults notion of *historical a priori*.

[16] These are terms that come from the posthuman tradition.

[17] Referring to a critical realist understanding of nature, in which nature is understood as the outcome of "structures, processes and causal powers that are constantly operative within the physical world" (Soper 1995: 155-156).

David Harvey is also fully aware of the complexity and interrelatedness of physical, biological, and social life, and sometimes wishes he could just follow the convictions of dogmatic Marxism (Harvey 1996: 3). He tries to develop a dialectical and relational approach to relations and totalities instead of understanding them through binaries and essentialist categories. But to understand everything as fluid and transitive, risks making us passive. Harvey gives ontological priority to fluxes, flows, and processes, but he emphasises that in doing this it is even more important to pay attention to the so-called 'permanences' — the concrete material dimension of the world that is the ultimate source of power. He draws on some foundational principles of dialectics and the Marxist tradition to ground meaning in "the concrete material historical and geographical conditions in which human action unfolds" (Harvey 1996: 8).

1.4.4 Human exceptionalism

Like Harvey, Donna Haraway also takes a relational approach to understand human-nature interaction. In contrast to Harvey, however, she belongs to the emergent trend in the human sciences which Harvey discards (Harvey 1996: 8). Her arguments reveal posthumanist influences. According to Haraway, the relation between humans and nature is "genuinely social and actively relational" (Haraway 1991: 3). This means that subjects and objects are not pre-constituted in the world, but are rather relationally determined through their specific historical, political, epistemological, ethical, technological, and linguistic engagements. In contrast to the western understanding of human-nature dualism, Haraway argues that the 'subjected Other' does not exist (Haraway 1991: 3; Haraway 2003: 7). These (falsely) subjected Others should be liberated. Science can be a tool for liberation if it is based on integration of social and natural science rather than on dualisms implying relations of domination (Haraway 1991: 19). The way forward, according to Haraway, is to acknowledge partial connections in which entities are neither wholes nor parts, but emergent. It is these partial connections that are the relations of significant otherness in which "non-harmonious agencies and ways of living that are accountable both to their disparate inherited histories and to their barely possible but absolutely necessary joint futures" are brought together (Haraway 2003: 7). This is the way forward to multispecies justice and harmonious relationships between humans and non-humans.

Kate Soper is sceptical towards Haraway's multispecies justice and her downplaying of differences between humans and non-humans to improve socio-ecological relations. In her words: "It is human ways of living, after all, that — much in contrast to the cyclical and reproductive mode of existence of other animals — are wrecking the planet, and humans alone who can do something about it" (Soper 2012: 366). If, following posthumanist convictions that there should be no distinction between the human and the non-human, normative distinctions coming from the humanist tradition are no longer valid. This becomes problematic when ethical judgements on specific hybrids are to be made, especially if the existence of these artefacts are embedded in human power structures (Soper 2012: 373). Humanism recognises the human propensity to reflect on human responsibilities and to rethink ideas of progress, prosperity, and human flourishing. This

should be done not only for human well-being, but also for the well-being of all other species. Posthumanism proposes that it can contribute to this undertaking as it opens up a debate about questioning what it means to be human. Critics add that this must include a certain acknowledgement of human exceptionalism (Soper 2012).

For the reason that eco-Marxists acknowledge, to a certain extent, human exceptionalism and because of the dialectical approach they adhere, posthumanists often criticise them for their anthropocentrism. According to Gareau (2004: 3), this is a misconception. In Marxism, and especially relational Marxism, there is in fact a focus on rethinking and avoiding nature-society dualisms. Rejecting anthropocentrism, however, is not the same as accepting human exceptionalism, as many Marxist thinkers do. Andreas Malm, following Karl Marx, argues that no other species than humans have such an omnivorous relation to nature that it leads to an unsustainable metabolism and unequal intra-species relationships (Malm 2016: 280). Hornborg (2015) also argues that it is the unique semiotic capacity of humans that enables abstract representation and language.

1.5 Reflections on relations among human biology, artefacts, and human consciousness

Social scientists coming from different scientific traditions, or even from different schools within them, have different ideas on how to understand the relation between humans and their environment, and who or what can be said to have agency. They resort to different epistemological strategies to make their argument, e.g. revealing underlying social relations (deconstruction) or dissolving dualisms (assemblage). I have roughly distinguished between the eco-Marxist and posthumanist influences which can be identified in the discussed arguments. From now on I will refer to the general categories eco-Marxism and posthumanism, while being aware of the diversity of perspectives within both schools of thought. I here focus on the relations among the factors human biology, artefacts, and human consciousness. In part II I will elaborate this by reflecting on how these factors relate to concerns about environmental destruction and social injustice in the Anthropocene.

Posthumanists put a strong emphasis on dissolving dualisms and avoiding grand theories. They try to find a way to go beyond the human and to abandon human exceptionalism. They thus do not understand agency as merely a human capacity, but instead argue that non-humans have similar agency as humans. In making this claim they 'level up' the status of non-humans and 'level down' the status of humans in order to understand agency as being dispersed throughout networks (Latour 1993; Castree 2001: 213). This means that humans and artefacts have the same sort of agency and that there is no pre-existing difference in power between humans and non-humans. Eco-Marxists, on the other hand, do not consider themselves as being anthropocentric, but certainly see the importance of acknowledging humans as being distinct from non-humans and to a certain extent accepting human exceptionalism (Soper 2012; Hornborg 2015; Malm 2016).

Another difference lies in how macro-structures and grand theories are taken into account in understanding a given situation. Posthumanists focus on the micro-level and case-by-case situations. They avoid talking about grand theories and macro-structures that pre-exist empirical phenomena and to which other practices can be reduced (Stengers 2013) or with which they can be explained, as if they do not need any explanation themselves (Latour 1993). Eco-Marxists do exactly the opposite and apply a historical material approach to understand situations by analysing their macro-structural conditions. These macro-structures influence human consciousness (Harvey 1996; Swyngedouw 1999; Hornborg 2015; Malm 2016). From an eco-Marxist point of view, human consciousness can be approached in two ways: either as false beliefs which need to be deconstructed, for example, the belief that it is the human ability to burn fire that is the 'essential trigger' that led to the Anthropocene (Malm and Hornborg 2014: 63), or as a more general worldview, including assumptions about relations among biological, social, ecological, technological, and cognitive factors (a topic on which I will reflect in Part II).

The next questions are what these different assumptions mean for the (hi)story that is told about the Anthropocene, and how this is related to social injustice and environmental destruction in this new epoch.

Part II: Narratives of the Anthropocene

2.1 Names do matter

The Anthropocene is a term for a new geological epoch proposed by a natural scientist and currently gaining in popularity. Does that mean that before the term was proposed there was no Anthropocene? And why the Anthropocene? Why do we not speak about the *Capitalocene* or *Technocene* (Malm and Hornborg 2014), or the *Plantationocene*, *Obscene*, *Euclidocene*, or *Chtulucene*? (Haraway et al. 2015). All different terms proposed by different scientists to indicate the same geological era, but based on other (hi)stories. They are just words, but, as Bonneuil and Fressoz (2016 [my emphasis]) ask, "*what is in a word*?" A word implies a story. Stories always present partial perspectives in which value is attributed to certain things and not to others and in which some perspectives, actors, events, and phenomena are emphasised while others are left out. Stories have the power to focus on what the author finds important and thereby constitute implicit or explicit moral justifications (Bonneuil 2015: 17-18). The Anthropocene may be *just a name* for natural scientists, "but names have a power of their own" (Stengers 2015: 139). The question is, is one *big new name* enough, or are several names desirable? (Haraway 2015: 160)

2.2 The Anthropocene: a story in the making

> "There is some reason to suspect … that the knowledge and discourse of the Anthropocene may itself form part, perhaps unknowingly, of a hegemonic system for representing the world as a totality to be governed."
>
> (Bonneuil and Fressoz 2016: 48)

The term 'Anthropocene' implies a narrative of the past and a vision of the future. The danger of the 'natural' narrative lies in its presentation as being factual. However, as argued above, this dominant western narrative is as normative as every other story (Bonneuil and Fressoz 2016: 47-48). Its purportedly 'true knowledge' of the Earth is part of the decontextualising and universalising, naturalist worldview of the west (Descola 1996). Other imaginaries exist but are suppressed by the dominant scientific perspective. This is problematic, as it provides humanity with a specific worldview implying a particular future based on scientific and technical progress that is represented as the salvation of humanity. It provides a worldview in which agency is ascribed to science and technology, while in reality it is derived from other human and non-human actors (Bonneuil and Fressoz 2016: 62-63). Importantly, this worldview excludes all alternative perspectives.

2.3 Different (hi)stories of the Anthropocene

Five general categories of narratives of the Anthropocene, based on different western scientific traditions can be distinguished: the first is the 'official' naturalist narrative, which so far has been highlighted and subjected to critique; second is the post-nature narrative, calling for 'the end of nature' and reveals posthumanist assumptions; number three is the eco-catastrophist, expecting collapse and arguing for rebuilding local resilience; four is the eco-Marxist narrative, in which authors rather refer to the Capitalocene; and last the eco-feminist narrative which argues that male domination degrades the Earth (Bonneuil and Fressoz 2016: 87).[18]

In this thesis the focus will be on the posthumanist and the eco-Marxist (hi)story. I specifically focus on these narratives because they are embedded in the critical tradition of social science theory. They focus on socio-ecological questions and see a responsibility for social scientists to empower the subjected and effectuate societal change (Horkheimer 1982; Haraway 1991).

2.4 The posthumanist narrative: politics beyond the human

The posthumanist narrative embraces the Anthropocene. Posthumanists feel acknowledged in their critique of modernity and its ontological separation of nature and society (Latour 2014b). The central challenge of the

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[18] These are the narratives that are distinguished in Western culture and identified by Bonneuil and Fressoz. The list of narratives, however, is not exhaustive.

Anthropocene for posthumanists is to find a way to rethink freedom, and to grant political agency to non-humans (Bonneuil 2015: 24-26).

2.4.1 The Parliament of Things

Latour points to the problem of grasping the Anthropocene from the perspective of the 'Modern Constitution', as the Anthropocene is a hybrid which is neither social nor natural. He thus asks: "In what world are these multitudes to be housed?" (Latour 1993: 50) Moderns have long tried to control the non-moderns and nature, but failed to do so. According to Latour this is because their Constitution is based on misconceptions: "Neither Nature nor the Others will become modern. It is up to us to change our ways of changing" (Latour 1993: 145). In the Anthropocene we need to go 'beyond the human' (Latour 2014a: 13). This means that we should change our conviction that the human domination over nature is emancipatory, to rather understanding it as attachment. By getting rid of the distinctions that are fundamental to the Modern Constitution and instead approaching nature and society as being one, there would be place for hybrids in a different and non-modern Constitution: *The Parliament of Things*, which represents hybrids rather than humans (Latour 1993: 51). In the Parliament of Things, the modern separation between natural science and technology revealing facts and the human sciences articulating values is overcome (Latour 1993: 142-145). Hybrids will still be formed but the difference lies in how they are understood and whether they are (or are not) visible. Understanding our relation to nature differently does not, however, mean that we should stop creating hybrids, or that we should be afraid of these 'monsters'. Instead we should 'love our monsters', if this is what can prevent climate change (Latour 2011).[19]

2.4.2 Technology as solution?

Posthumanism should not be confused with transhumanism, i.e., an ideology that draws on technology to achieve a 'posthuman future' of enhanced human capacities (Lipińska and Fuller 2014). Although based on completely different assumptions, posthumanism is commensurable with ecomodernist solutions (Bonneuil 2015: 26). However, there are posthumanists who argue against ecomodernist solutions. Haraway, for example, is critical towards high-tech solutions to environmental problems and in this respect distances herself from the posthuman tradition. She calls herself a 'compost-ist' (Haraway 2015: 161). Still, her arguments reveal posthumanist components. Haraway proposes to go beyond the human and argues that it is the western ideology founded on false dichotomies, in which social relations shape and are shaped by illusions of modernity and progress, that made the Anthropocene happen. Although she prefers talking about the Capitalocene (in line with the eco-Marxists; see next section) instead of the Anthropocene, she remains sceptical towards both (hi)stories, as they both draw boundaries that distinguish humans from other

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[19] In a later article Latour reconsiders his enthusiasm about ecomodernist solutions and retracts his argument made earlier (Latour 2015). However, this does not mean that posthumanism and ecomodernism are incommensurable, as things are far more complicated and a posthumanist can be in favour of ecomodernism or argue against techno-fix solutions.

creatures. For her, a narrative of the Anthropocene should be a story that leaves behind western humanist traditions. It should be a story that can serve as a powerful tool to imagine a society which is not based on ideologies and relations of domination. It should include humans but myriads of other creatures too. She thus tells the story of 'the Chthulucene' (Haraway 2014; Haraway 2015).

2.4.3 The Chthulucene

The Chthulucene is named after "the diverse earth-wide tentacular powers and forces and collected things with names … it entangles myriad temporalities and spatialities and myriad intra-active entities-in-assemblages-including the more-than-human, other-than-human, inhuman, and human-as-humus" (Haraway 2015: 160). It includes the past, the present, and the future. It raises awareness that there is no species that exists on its own. History is made through the "assemblages of organic species and abiotic actors". To clarify her argument, Haraway refers to endosymbiotic processes: processes in which microorganisms are active inside cells, which leads to the complexity of multicellular life that is fundamental to the evolution of the human species: the individual western human does not exist on his or her own, but in relation to organic and inorganic species surrounding him/her (Haraway 2014). This awareness should be conducive to multispecies justice. To achieve this, illusory naturalisations of false dualisms have to be destabilised in order to build up new, non-hierarchical relationships of 'kin'. Kin here implies more than ancestral or genealogical relations. It implies "kin in the deepest sense," in which all "earthlings are kin" (Haraway 2015: 162). By creating new sorts of kin-relationships, we can establish "robust biological-cultural-political-technological recuperation and recomposition" (Haraway 2015: 160).

What do these relationships of kin look like? And how can we include non-humans in our politics? As Latour finishes his book: "I have done my job as philosopher and constituent by gathering together the scattered themes of a comparative anthropology. Others will be able to convene the Parliament of Things" (Latour 1992: 145).[20]

2.5 The eco-Marxist narrative: the Capitalocene

The Anthropocene is not only about the geological changes which can be objectively identified. The geological changes of the Anthropocene should not be separated from its history (Malm and Hornborg 2014). Eco-Marxists thus emphasise that we should not understand the Anthropocene in its current state (the geological changes) but as a consequence of its historical socio-material relations (capitalism) embedded in a capitalist world-system. They prefer to speak about the Capitalocene, in which "a rematerialised and

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[20] Unfortunately, because of limited time and space, I am not able to pursue this further. Therefore I would recommend you to read ideas from the *Parliament of Things*, an initiative that explores conversations between things, people, plants, and animals to design an actual *Parliament of Things*: http://blog.theparliamentofthings.org/, and also the working group AURA: Aarhus University Research on the Anthropocene discovering "co-species landscapes": http://anthropocene.au.dk/profile/.

ecological history of capitalism appears as the indispensable partner of the Earth System sciences to understand our new epoch" (Bonneuil and Fressoz 2016: 252). To understand the Anthropocene, eco-Marxists understand the integration of the capitalist world-system and its intra-human relations as interrelated with the Earth System, which is characterised by an unsustainable socio-ecological metabolism.[21]

2.5.1 World-system analysis

Immanuel Wallerstein introduced world-system analysis in the 1970s to understand the capitalist world economy. According to this analysis the world economy consists of political units and cultures and groups that are integrated by a division of labour. A capitalist economy gives priority to capital accumulation and exists within a world economy. The capitalist world economy can be divided into core production processes and peripheral production processes, in which core-periphery are relational concepts, and belonging to the core or the periphery is determined by the profitability of a given production process. Due to power relations there is unequal exchange between the core and the periphery, and surplus-value is transferred from the periphery to the core in a continuous flow (Wallerstein 2004). For a capitalist world-system to exist, these processes have to be structurally unequal, the core being dependent on wage labourers in the periphery (Bonneuil and Fressoz 2016: 224). Due to unequal exchange the core can accumulate wealth at the expense of its periphery, which is often legitimised through the promise of a higher standard of living and maintenance of socio-economic facilities: a so-called 'win-win situation' (Bonneuil and Fressoz 2016: 224).

2.5.2 Unequal ecological exchange, time-space appropriation, and environmental load displacement

Other observations on unequal exchange between core and periphery emphasise that raw materials are extracted from the periphery and that their environments are polluted (Bonneuil and Fressoz 2016: 224). Because of these ecological-economic contradictions, the political-economic critique of the capitalist world-system is joined with an ecological critique. This critique is closely connected to Marx's concerns about the metabolic rift (Foster and Holleman 2014). Marx's understanding of the metabolic rift is a systemic ecological critique of capitalism and refers to the unsustainable social metabolism of capitalist production systems and the alienation between human societies and the material flows of the Earth System (Foster and Holleman 2014; Marx 1981). The notions of metabolic rift, unequal exchange, and imperialism are at the basis of unequal ecological exchange theory (Foster and Holleman 2014: 207). Unequal ecological exchange analyses show how given quantities of ecological 'use values' (matter-energy) are exchanged for less (Foster

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[21] Social metabolism refers to how human societies organise exchanges of energy and material flows with the environment (Martinez-Alier et al. 2010). Karl Marx's notion of metabolic rift refers to the asymmetric material exchange between city and countryside, humans and nature (Marx 1981)

and Holleman 2014: 205). This is problematic for two reasons: one, it is environmentally unsustainable,[22] and two, it relies on global inequalities. The social metabolism of global relations of unequal exchange between the core and the periphery make accumulation possible. The accumulation corresponds to an ecological rift, which indicates the unsustainable metabolic exchange between society and the ecological systems on which it depends (Foster et al. 2010). An illustration of unequal ecological exchange is the phenomenon of time-space appropriation. This refers to how the core uses embodied labour (the labour time that is needed for the production of a product) and embodied land (the land surface that is needed for production) from the periphery to satisfy its own needs (Hornborg 2011).

Unequal ecological exchange and time-space appropriation in a capitalist world-system are the driving forces of fossil-fuel dependent technologies. These technologies, Hornborg proposes, only have power because they are embedded in social relations of unequal exchange and are dependent on asymmetric resource flows obscured by the global market. In other words, technological progress in the core depends on its periphery, where labour and land is cheaper. Unequal ecological exchange and time-space appropriation causes environmental damages in the periphery such as soil degradation, air pollution, garbage disposal, floods, and droughts. This is conceptualised as 'environmental load displacement' (Hornborg 2011: 54). Technological progress may solve environmental problems locally, but only at the expense of places elsewhere (Hornborg 2015: 61).

This analysis provides another perspective on global environmental history and the Anthropocene. It is a (hi)story of social injustice in which so-called progress is only possible through the unequal exchange of embodied labour and embodied land within a capitalist world-system (Hornborg 2011).With their emphasis on world-system analysis and social relations, eco-Marxists do not attribute the environmental crisis to anthropocentric attitudes (Garrard 2012: 31) but to processes of capital accumulation that have changed the material metabolism worldwide, through the construction of roads, railways, plantations, power plants, etc. This is what has led to changes in the geological processes (Bonneuil and Fressoz 2016: 223).

2.5.3 The Capitalocene

Rather than adopting the standard narrative of the Anthropocne, eco-Marxists propose the Capitalocene. In the Capitalocene it is theorised how processes of metabolic rift, commodification, unequal (ecological) exchange, time-space appropriation, and environmental load displacement, all mystified by the logic of capitalist expansion, are the essential drivers of environmental change (Bonneuil 2015: 27-29). The Marxist argument is that it is the global system of capital accumulation embedded in a world-system that was

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[22] For an explanation why this is environmentally unsustainable I again refer to Georgescu-Roegen's analysis of the Second Law of Thermodynamic (the Law of Entropy) (Foster and Burkett 2008). This analysis, however, is beyond the scope of this thesis.

prerequisite for the invention of the steam engine instead of human's ability to make fire (Malm and Hornborg 2014).[23]

The Anthropocene should thus not be about understanding human biology or environmental changes but about relations of production (Malm 2016: 278). Only by accepting this, we might be able to curb global warming (Malm 2016: 278).

> "Today, the biosphere is unstable and capitalism stable, but to understand why we have reached this place, the two must switch positions."
>
> (Malm 2016: 278)

Understanding different histories in their materiality can engender new dialogues in which democratic political influence is regained by civil society over the industries, oligarchies, and other powerful actors that are prerequisite to environmental destruction in the Anthropocene (Bonneuil and Fressoz 2016: 291). Illumination of how these historical processes are closely tied to ecological processes, and revelations of the uneven distribution of environmental problems, are conducive to struggles for environmental justice (Hornborg 2011: 54). The acknowledgement of the Anthropocene (or Capitalocene) should lead to a politicisation of ecology, a redistribution of social power, and a demand for more egalitarian and just modes of production (Swyngedouw 2011: 82).

> "To strive for decent lives in the Anthropocene therefore means freeing ourselves from repressive institutions, from alienating dominations and imaginaries. It can be an extraordinary emancipatory experience."
>
> (Bonneuil and Fressoz 2016: 291)

2.6 Understanding relations among the different factors in narratives of the Anthropocene

The relations and connections among human biology, artefacts, and human consciousness in posthumanist and eco-Marxist assumptions have been addressed in part I. These factors can now be related to social injustice and environmental destruction in the context of the Anthropocene.

2.6.1 Posthumanism

In reflecting on the relation among the three factors discussed in Part I, I concluded that the downplaying of differences between humans and non-humans is a characteristic of posthumanism. Posthumanists thus do not distinguish between the agency of humans and that of artefacts. This becomes clear in their narrative of the

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[23] A historical overview of unequal economic and ecological exchange since 1600 is given by Bonneuil and Fressoz (2016), in chapter 10, *Capitalocene: A Combined History of Earth Systems and World-Systems*.

Anthropocene, in which they argue that we should strive for a politics *beyond the human*. It is not just humans that should be acknowledged as having agency, but any other entity that is part of the story as well. These other agents or 'actants' can be organisms or things but also non-material features, such as language. Humans and non-humans should all be part of politics (Latour 2014a). Because of their focus on the micro-level and their case-by-case approach, posthumanists do not take into account any grand theories or acknowledge pre-existing macro-structures to explain what is at stake in a certain situation. According to posthumanists, the main problem of (mis)understanding the Anthropocene lies in the assumptions of modern science and its focus on human exceptionalism or ecocentrism (Castree and MacMillan 2001). Posthumanists advocate a non-humanist approach in which they understand humans and artefacts as developing together in micro-scale socionatural networks. Only after the establishment of a network can an explanation be given for the occurrence of particular phenomena, which should include social injustice and environmental destruction.

2.6.2 Eco-Marxism

The relation among the five factors that is presumed in the eco-Marxist narrative is easier to ascertain than it is for the posthuman narrative. This, among others, is due to their acknowledgement of pre-existing categories and power relations. Eco-Marxists distinguish between humans and artefacts in terms of their respective influence on or consequences for social inequality and environmental destruction. The relations among the five factors (human biology, society, ecology, artefacts, and consciousness) can thus not be explained as merely emerging in undifferentiated networks, without taking into account pre-existing structures. Instead of acknowledging social inequality and environmental destruction as only existing in specific socionatural networks, eco-Marxists begin their analyses by understanding inequality and environmental destruction as generated by pre-existing societal structures. They come to the conclusion that these structures can be traced to human biology, artefacts, and specific forms of human consciousness.

Human biology here refers to the human capacity for symbolism and abstract representation (Malm 2016; Hornborg 2017), which is prerequisite to the capitalist world-system. The capitalist world-system is, subsequently, prerequisite to the operation and profitability of artefacts such as fossil-fuel burning technology (Hornborg 2011; Malm 2013, 2016). Consequences of the capitalist world-system and fossil-fuel-burning technology are social injustice and environmental destruction.

Human biology in this narrative is thus understood differently than in the natural narrative. In the natural narrative it is assumed that the ability of human species to make fire is prerequisite to the invention of the steam engine. This perception, according to eco-Marxists, is problematic as it completely misunderstands the socio-political dimension of climate change and takes away responsibility — due to the naturalisation and depoliticisation of the narrative — of the fossil-fuel burning core to change it practices and prevent environmental destruction and social injustice. From an eco-Marxist perspective, it is not the 'fire-ape', but a

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specific fossil-fuel burning human living in specific historical, socio-material relations who has can be held responsible for changing the Earth System (Malm and Horbnorg 2014). So differently than understanding climate change as an inevitable outcome of human nature, eco-Marxists see it, in the words of Hornborg (2015: 60): as "a necessary but not *sufficient* condition." This means that it is the human's capacity for symbolism and abstract representation that is prerequisite for the existence of the world-system, and consequently environmental destruction and social injustice.

2.7 Political change in the Anthropocene

Eco-Marxists have a clear political program focusing on macro-level structures and questioning cornucopian ideas of capitalist production systems (Garrard 2012: 32). They have a strong focus on social injustice and its relation to environmental destruction. They assign responsibility to a specific fossil-fuel burning human for environmental changes (Malm and Hornborg 2014). To prevent environmental destruction and contribute to social justice, it is up to civil society to regain political influence over industries, oligarchies, and other powerful actors which are prerequisite to environmental destruction in the Anthropocene (Bonneuil and Fressoz 2016: 291). Posthumanists, on the other hand, have a less specific political program. Their focus is much more on the micro-level and case-by-case 'hybrid' politics. In a hybrid politics the nature-culture divide is abandoned, and all actants are to be considered simultaneously. Another important implication of hybrid politics is abandoning ecocentrism and anthropocentrism, as there should not be any pre-existing interests. Relational ethics are key and therefore the discrete political subject does not exist (Castree and MacMillan 2001: 220).

A simple dissolution of the categories 'natural' and 'social' (i.e., a posthumanist approach) may not help us address problems of social injustice in the Anthropocene. Social injustice and environmental destruction can only be explained within the context of a given network, rather than understood as pre-existing facts (Castree and MacMillan 2001). As these two factors concern me a lot and seem even to be the starting-point in order to understand what is at stake in the Anthropocene, I hesitate to follow a posthumanist approach to understanding the Anthropocene. It also seems inadequate for challenging ecomodernist and techno-fix solutions (Bonneuil 2015). These inadequacies are in part due to the focus on the micro-level. This is not to say that a posthumanist cannot have a strong political vision: Haraway, for instance, has a critical political message regarding relations of power, capitalist accumulation, and imperialism (White et al. 2016). But as this is not inherent in the posthumanist perspective as such, the posthuman narrative is often linked to notions of the 'good Anthropocene' and remains inadequate to radically challenge an ecomodernist approach (Bonneuil 2015). As argued at the beginning of this thesis, an ecomodernist approach and technological solutions will not solve problems of social and environmental justice, nor can they provide any long-term assurance with regard to sustainability because they are intrinsically dependent on environmental load displacement and ecologically unequal exchange (Bonneuil and Fressoz 2016; Hornborg 2015).

If the aim is to establish social justice and ecological sustainability in the Anthropocene, a posthumanist approach appears not to be enough. Eco-Marxism, on the other hand, because of its focus on power and social inequality, its clear political program, and acknowledgement of human exceptionalism to a certain extent, seems more useful in addressing problems of social justice and ecological sustainability in the Anthropocene. However, it is not my aim to simply dismiss posthumanism as invalid, as within posthumanism there is a great variety of arguments and different visions. Some of its insights can be quite useful, especially when it comes to understanding micro-level interactions between humans, non-humans, institutions, and social processes (White et al. 2016: 133). Like Kate Soper (2012), I believe that posthumanists can contribute a great deal to thinking about what well-being means for humans, other species, and the environment, but rather than only focusing on establishing harmonious local eco-communities, we also have to challenge the capitalist world-system.[24]

Part III: What the future holds: science fiction in the Anthropocene

3.1 Justice in alternative societies

A critical analysis is not only about scrutinising foundational beliefs. It is also important to come up with meaningful alternatives (Harvey 1996: 3). The Anthropocene introduces a new geological epoch in which often the need for more justice is emphasised (among others Harvey 1996; Burns 2008; Chakrabarty 2012; Foster et al. 2010). But what is a more just society? Justice is a discursive concept that is bound to a particular place and time dependent on beliefs, social relations and institutions. This, however, does not mean that justice is relative and that we cannot make any judgements about it. To be able to make a normative judgement about justice, I follow David Harvey (1996) that justice also has a material dimension. This means that justice is in the first place a socially constituted concept, which gets institutionalised in a specific place and time and becomes a 'permanence'. This concrete but contingent meaning of justice in a specific context will be reinforced through particular social practices (Harvey 1996: 330-331).

To analyse different perspectives of justice I again draw on Harvey. I use his concept 'dialectical utopias'. A dialectical utopia enables to analyse alternative perceptions on justice by visualising alternative possible societies with different social relations, institutions, or ideologies. A dialectal utopianism is not a spatial utopianism of form based on absolutism and closures. Instead, a dialectical utopianism is a utopianism of process. This means that a Utopia is given as an experimentation and exploration of a wide range of possible alternatives in the form of production systems, modes of living, gender relations, socio-ecological relations etc. and does not give an ultimate form (Harvey 2000: 182). A thought experiment of dialectical utopianism is useful in the Anthropocene, as Chakrabarty reminds us, it is impossible to experience ourselves as a geological force because of the large gap between our actions and environmental changes (in space and

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[24] I will not go deeper into the question of how to challenge the capitalist world-system in this thesis, although I realise how important it is to come up with real strategies for change.

time), but, he argues, art and fiction can broaden our understandings of what certain acts now will mean for other places and the future (Chakrabarty 2012: 12).

To make sketches about desirable and plausible future societies without claiming them to evolve exactly like this, simply because of the impossibility of it, I, as argued before, follow the argumentation of Sayer that: "Even if actual examples of similar practices are not available, conducting thought experiments and asking counterfactual questions is at least better than leaving alternatives unexamined" (Sayer 2000: 162). Science fiction novels seem to be helpful for conducting a thought experiment in the form of a dialectical utopia.

3.2 Le Guin's science fiction novels: an exploration of alternative societies

Le Guin did attempt to create alternative worlds in the science fiction novel series of the Hainish Cycle.[25] She explores a variety of societies that evolve under a particular set of ecological, historical and geographical conditions. These are important aspects of a dialectical utopia (Harvey 1996: 333). The science fiction novels of Le Guin are circumscribed as 'critical utopias' by literary critics. A critical utopia has not the aim to create a sort of perfect society, but is rather a tool to critically question society and has the aim to morally and ethically improve it (Burns 2008: 2-3). Science fiction serves two functions: it has the function of utopian art to represent a future in which other societal foundations shape society; and it has the power to address latent ideological assumptions (Bould and Miéville 2009: 48).

Reading utopian science fiction gives understanding of different social practices, and particular ideologies of justice among different societies. To analyse what more or less plausible futures of the Anthropocene can be, I conduct an ecocriticism of the novel *The Dispossesed* to open up the debate between different environmental perspectives that are visualised by Le Guin. In *The Dispossessed* Le Guin envisions two worlds: one that is comparable to the modern western world, and an alternative society based on anarchism. Le Guin describes the beauty, but also the roughness of each world. Again I will reflect on the relation among the five factors in the different societies that Le Guin describes, and analyse influences of socio-ecological theory in her writing.

3.3 A short introduction to the story of The Dispossessed

The Dispossessed is part of the series *Hainish cycle*. The series tells of 84 different planets colonised by the Hain people hundreds of thousands years ago. The Hain are now trying to establish the Ekumen: diplomatic relations between the planets to facilitate the exchange of material goods and ideas, to increase knowledge, create harmony but also out of curiosity, adventure and delight (Le Guin 2000 [1969]: 50).[26] The novels are

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[25] A collection of science fiction novels written by Ursula K. Le Guin between 1966 and 2000.

[26] I used the e-book version for conducting the ecocriticism. In e-books the page numbers change when changing the size of the book. I used the page numbers that were given when reading the book full-screen.

set up as stories in which an individual coming from one planet explores, questions, and lives on another planet. The different social and environmental circumstances, which are found on each planet, makes reading the novels an anthropological journey.

The story of *The Dispossessed* tells about Shevek, a physicist coming from Anarres. He visits Urras to exchange ideas about a new 'Theory of Simultaneity'. The Urrasti are first and foremost interested in getting the knowledge of Shevek's theory to strengthen their superior position in the Ekumen. For Shevek it is mainly a journey to establish brotherhood between Urras and Anarres and to show solidarity towards the Urrasti (Le Guin 2006 [1974]: 211).

The socio-cultural beliefs on Urras are completely different from the ones on Anarres. A group of revolutionaries following the ideas of Odo (which will be illustrated throughout the following paragraphs) saw Urras as an unjust society and started a revolution. The Odonians[27] were experienced as a danger to the authority of law and national sovereignty on Urras. This led to the decision to give the Moon, Anarres (and Urras is Anarres' moon just depending on where you are), to the Odonians. This planet was given under the condition of a Trade agreement to make sure that the Urrasti can continue mining of rare metals on Anarres.

The Odonians had now a place, outside the societal structures of Urras, to start their own anarchistic society named Abbenay, which means Mind (Le Guin 2006 [1974]: 146). Different from the comfortable climate and biodiversity that is found on Urras, Anarres is a planet of scarcity, dryness, low vegetation and no animals except for some fish, worms and holum trees:[28]

> "Man fitted himself with care and risk into this narrow ecology. If he fished, but not too greedily, and if he cultivated, using mainly organic wastes for fertilizer, he could fit in. But he could not fit anybody else in. There was no grass for herbivores. There were no herbivores for carnivores. There were no insects to fecundate flowering plants; the imported fruit trees were all hand-fertilized. No animals were introduced from Urras to imperil the delicate balance of life. Only the Settlers came, and so well scrubbed internally and externally that they brought a minimum of their personal fauna and flora with them. Not even the flea had made it to Anarres."
>
> (Le Guin 2006 [1974]: 269)

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[27] The revolutionists who fought for Odo's ideas.

[28] The stories I retell are not exhausting, nor do their physical environments link to the future that will necessarily follow on the particularities of each society: the desert landscapes of Anarres, or the beautiful green landscapes of Urras. The only realistic physical landscape would probably be on Terra where the humans faced an ecological crisis and continued business as usual. They ecologically destroyed the planet.

3.3.1 A brief oversight of the main characters and places

Shevek is the main character of the novel. He was born on Anarres and travels to Urras.

Urras is the planet that is visited by Shevek.

Anarres is another planet that is given to the Odonians to built up their own anarchistic society.

Odonians are the revolutionists who fought for Odo's ideas and against injustice 200 years ago.

Odo was a woman who lived 200 years ago and wrote the *Analogy: The Social Organism*.

The Social Organism forms the fundaments of Odo's Utopia, Abbenay.

Abbenay, which means mind, is the society that is founded on Anarres by the Odonians.

3.4 The disasters of continuing business as usual

Just as scientists who study the Anthropocene, whether social or natural, Le Guin underwrites that continuing business as usual will lead to ecological disasters.

> "My world, my Earth, is a ruin. A planet spoiled by the human species. We multiplied and gobbled and fought until there was nothing left, and then we died. We controlled neither appetite nor violence; we did not adapt. We destroyed ourselves. But we destroyed the world first. There are no forests left on my Earth. The air is grey, the sky is grey, it is always hot. It is habitable, it is still habitable, but not as this world is. This is a living world, a harmony. Mine is a discord. You Odonians chose a desert; we Terrans made a desert… We survive there as you do. People are tough! There are nearly a half billion of us now. Once there were nine billion. You can see the old cities still everywhere. The bones and bricks go to dust, but the little pieces of plastic never do—they never adapt either. We failed as a species, as a social species."
>
> (Le Guin 2006 [1974]: 493)

This excerpt shows how Le Guin visualises destructive forces of humanity that led to environmental destruction. The Terrans who sill live on Earth (Terra) do not live the 'good life' anymore. They have to struggle to survive. Keng, the Ambassador of the Terrans now living on Urras, knows that she does not want to live the life as it is on Terra today. She prefers living on Urras. Urras, according to her, is what a world should be: "alive, tremendously alive—alive, despite all its evils, with hope" (Le Guin 2006 [1974]: 492).

Meanwhile, Keng is aware of the human injustice, greed, folly and waste on Urras, she rather sees the good, the beauty, vitality, achievement.

> ""Let me tell you how this world seems to me. To me, and to all my fellow Terrans who have seen the planet, Urras is the kindliest, most various, most beautiful of all the inhabited worlds. It is the world that comes as close as any could to Paradise.""
>
> (Le Guin 2006 [1974]: 492)

Keng speaks the language of natural scientists. She explains that it was *human species* that spoiled the planet. She completely denies the social relations of the lifestyles of the Terrans and Urrasti that are — as eco-Marxist theory tells us — the actual cause of the ecological problems. She considers Urras, which exposes how a 'good Anthropocene' could potentially look like, as a Paradise. Shevek coming from Anarres does not agree with Keng and he frustrated tells her: "I don't want to die yet, and I don't want to die here in Hell at all" when he refers to Urras that to him is rather a place of injustice (Le Guin 2006 [1974]: 497).

Alternatives to business as usual and a 'good Anthropocene' are present in the different narratives of the Anthropocene, but also in the Le Guin's science fiction.

3.5 Ecological revolution: a new relation with the environment

In the Anthropocene, scientists are, just like Le Guin, looking for alternative views on human-nature relations that reject the modern understanding that humans control nature. The Anthropocene has the potential to be the beginning of an ecological revolution, in which an ecological revolution is understood in Carolyn Merchant's (1989) sense as: "processes through which different societies change their relationship to nature" (Merchant 1989: 23). A consummation of such a revolution does not only result in new constructions of nature in its material dimension, but also in human consciousness.

What does an ecological revolution mean for society? And how is this related to a certain worldview? To answer these questions, I analyse how Le Guin envisions human-nature relations on Urras and Anarres to find out how human-nature relations differ among the two societies, and whether we can or cannot speak of an ecological revolution when comparing them to Terra. To analyse the (changing) human-nature relations (challenging business as usual, or Terra), I scrutinise relations among the five factors, and use insights of socio-ecological theory and narratives of the Anthropocene, to evaluate the potential of the described societies to challenge status quo and to bring about social justice and ecological sustainability, and to find out what such an alternative society could possibly look like.

3.6 Key characteristics of Urras and Anarres

When Shevek enters the spaceship to travel to Urras he is surprised by all the 'mysterious' electrical devices "-a sign, Shevek thought, either of great faith in human nature, or of great quantities of hot water" (Le Guin 2006 [1974]: 26). Shevek is not only confused by the material dimension, but also by the different norms, values and convictions of the Urrasti.

3.6.1 Different perceptions of human nature

Le Guin experiments with different perceptions of human nature in her novel. On Urras human nature is perceived to be determined by human biology, as Chifoilisk (an Urrasti) reminds Shevek:

> ""No need to pretend that all you Odonian brothers are full of brotherly love," he said. "Human nature is human nature.""
>
> (Le Guin 2006 [1974]: 101)

The Urrasti assume that humans are, because of their (unchangeable) human nature, greedy and selfish, but also inventive and superior to other species and nature. These assumptions on human nature pretty much influence the societal structures on Urras, and the relationships among Urrasti themselves. As Shevek gets assured by Vea, another Urrasti: "I don't care about other people, and nobody else does, either" (Le Guin 2006 [1974]: 293). The Anarresti, on the other hand, have a complete different perspective on this and assign a specific human nature to a particular consciousness and regard it as the outcome of certain societal structures. The greediness of the Urrasti, according to Shevek, is not a consequence of their 'human biology', but a consequence of their worldview and economic structures.

3.6.2 Human-nature relations

The Urrasti value nature for its beauty and preserve nature for leisure. When Shevek arrives on Urras he also is bewildered by the beauty of it:

> "It was the most beautiful view Shevek had ever seen. The tenderness and vitality of the colors, the mixture of rectilinear human design and powerful, proliferate natural contours, the variety and harmony of the elements, gave an impression of complex wholeness such as he had never seen, except, perhaps, foreshadowed on a small scale in certain serene and thoughtful human faces."
>
> (Le Guin 2006 [1974]: 102)

The birds, the plants, the nature; it was all there. On Anarres you will not find a landscape like this where everything is barren, arid, and inchoate. However, when Shevek spends more time on Urras he experiences that the beauty gets replaced by 'an unjust beauty' (Le Guin 2006 [1974]: 298). He questions why the Urrasti deserved this place as their society is build on exploitation, inequality and injustice, while life on Anarres, where everyone takes care of each other and of nature, is about survival through the climatic circumstances. Soon he comes to the conclusion that, while life on Anarres might be difficult sometimes, life is beautiful and people are free. This, experiences Shevek, is different on Urras where social justice remains absent and is disconnected from the ecological dimension. The aesthetic love for nature on the one hand, and the understanding of nature as resources, commodities and a property of the humans to be controlled on the

other, which can be identified in Le Guin's description of Urras, visualises a modern worldview on nature. In this worldview nature is experienced as complete 'Otherness' and based on an ontological distinction between humans and nature (Soper 2005).

3.6.3 A propertarian or sharing economy?

Not only nature, but basically everything which is non-human is regarded inferior to humanity on Urras. They adhere an anthropocentric worldview. For this reason the Anarresti regard them as being 'propertarians'. Owning other things, which can be objects and animals but also knowledge or even people, gives a certain power to the owner over the non-owner. Ownership is by the anarchistic Anarresti perceived as a 'moral thorn'. Besides the ideological dimension of ownership which leads to unbalanced power relations and injustice, it also has a material dimension. If everyone is in need for more and looking after private property then this will lead to excess and waste (Le Guin 2006 [1974]: 164-165) and: ""*Excess is excrement,*" Odo wrote in the Analogy. *"Excrement retained in the body is a poison""* (Le Guin 2006 [1974]: 148 [my emphasis]).[29] This deviating view on property by Anarresti lies at the fundaments of their society in which sharing is the norm and in which less material goods might even be desirable.

> "[T]here was no artificial lighting provided from an hour before sunrise to an hour after sunset. No heat was furnished when the outside temperature went above 55 degrees Fahrenheit. It was not that Abbenay was short of power, not with her wind turbines and the earth temperature-differential generators used for heating; but the principle of organic economy was too essential to the functioning of the society not to affect ethics and aesthetics profoundly."
>
> (Le Guin 2006 [1974]: 148)

On Anarres, unlike on Urras, justice and equity are leading principles and considered as connected to the ecological dimension. Anarres is based on an organic economy of social conscience, while on Urras material property and status based on ownership form the basis of their propertarian economy. This, as imagined by Le Guin, has consequences for the solutions that are offered to prevent environmental destruction.

3.7 Solutions to prevent environmental destruction

The different perceptions upon human nature, excess, justice and property, but also the economic structures between Urras and Anarres, influence the solutions they offer to prevent environmental destruction.

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[29] The body refers to the *The Social Organism* which forms the fundament of Odo's Utopia, Abbenay.

3.7.1 Pragmatic 'problem-solving' solutions on Urras

Urrasti are aware of destructive human forces to nature and, as analysed above, nature is of great value to them. Not only nature, also material progress, property and economic growth are of importance and are assumed to bring prosperity. To prevent environmental destruction, Urrasti follow solutions without questioning societal structures or beliefs about prosperity at all. Their power supply for example, comes from nuclear fusion plants efficiently governed by a 'propertarian economy', and limited car use is regulated top down. Scientists coming from district 'A-Io' play a central role in 'solving the problems':

> "There were not many of them on the roads: the hire was expensive, and few people owned a car privately, because they were heavily taxed. All such luxuries which if freely allowed to the public would tend to drain irreplaceable natural resources or to foul the environment with waste products were strictly controlled by regulation and taxation. His guides dwelt on this with some pride. A-Io had led the world for centuries, they said, in ecological control and the husbanding of natural resources."
>
> (Le Guin 2006 [1974]: 125)

But, one might question, taking into account the critique of social scientist on the Anthropocene: *is this enough?*

3.7.2 Social injustice, unequal ecological exchange, time-space appropriation, and environmental load displacement

The excess of resources the Urrasti once experienced is something that belongs to the past. They found a way to deal with this to continue their exuberant lifestyles, "their only lasting effect being the shortage of certain metals, which fortunately could be imported from the moon" (Le Guin 2006 [1974]: 125).

> "It was, for them, a very good bargain. The division of their cargoes eight times a year was the most prestigious function of the Urrasti Council of World Governments and the major event of the Urrasti world stock market. In fact, the Free World of Anarres was a mining colony of Urras."
>
> (Le Guin 2006 [1974]: 143)

The mining work is physically and emotionally exhausting and takes place in an environment of dust that affects the health. When Anarresti actually question the trade agreement they again and again come to the conclusion that:

""It would cost the Urrasti more to dig the ores themselves; therefore they don't invade us. But if we broke the trade agreement, they would use force." It is hard, however, for people who have never paid money for anything to understand the psychology of cost, the argument of the marketplace."

(Le Guin 2006 [1974]: 140)

These excerpts show the latent power of the Urrasti over the Anarresti who, through following a logic of moral reasoning and by fighting for their values, voluntarily sign up to do the mining work. The Anarresti now have a place to live the life according to their norms and values, and the Urrasti can still make use of the rare metals: a so-called 'win-win' situation. This win-win situation, however, is not as benign as it seems on first sight. Or as Hornborg (2011) argues, instead of approaching this as a cornucopia, we should rather understand it as a zero-sum game. It is a situation of unequal (ecological) exchange possible due to unequal power relations. This excerpt shows how Le Guin draws on world-system theory to visualise how the core (Urras) can maintain its social order and infrastructure as a result of their power over the periphery (Anarres), which they exploit for raw materials, and thereby pollute local environments (Bonneuil and Fressoz 2016: 224).

The Urrasti are dependent on a world-system, unequal ecological exchange, and time-space appropriation to sustain their abundant lifestyles while causing environmental load displacement on Anarres. This relation between Urras and Anarres serves as an example of eco-Marxist concerns and their critique upon ecomodernism,[30] the natural narrative and more broadly the capitalist world-system. There is a seemingly local (short-term) solution for resource shortages, but this causes environmental destruction in other places (e.g. mining on Anarres). This has devastating consequences for both, social justice and ecological sustainability.

This is precisely what the Capitalocene seeks to reveal: "how the accumulation of money and technology in core areas of the world-system occurs at the expense of the natural resources, environment, and health of their peripheries" (Hornborg 2011: 15). Global environmental history analysis shows that the global expansion of hegemonic Europe relied on environmental load displacement to their hinterlands in which resource extraction through mining and deforestation led to soil exhaustion and reduced biodiversity with additional side-effects for local populations such as food shortages (Hornborg 2011: 53).

3.7.3 What about Anarres?

On Anarres justice has a completely different role in society. The Anarresti have the conviction that justice should be the key value of a society. In their worldview (or consciousness) humans have a moral responsibility to contribute to justice and well-being in the first place. This leads to a different understanding

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[30] Although Urras shows similarities to ecomodernist solutions, it is not a blueprint of an ecomodernist society.

of humans' relation to possession and artefacts. As analysed above, the basic principles of the Anarresti society as written by Odo in the *Analogy*: "excess is excrement". Excess will lead to greed, but also to environmental destruction (Le Guin 2006 [1974]). To sustain this worldview and protect society's ethics and aesthetics, an organic economy based on sharing and harmony, instead of a propertarian economy is desirable by the Anarresti. Environmental destruction and preventing it, is thus based on another worldview. In this worldview social justice and taking care are leading, not property and technology. This means that the Anarresti are in the first place responsible for each other, and responsible to keep a balanced relationship to the environment. It is civil society and not natural scientists who can do this (Le Guin 2006 [1974]).

> "The Settlers of Anarres had left the laws of man behind them, but had brought the laws of harmony along"
>
> (Le Guin 2006 [1974]: 134-135)[31]

3.8 Relations among the different factors on Urras and Anarres

An explanation for the different solutions to prevent environmental destruction and how this relates to social justice on Urras and Anarres, as imagined by Le Guin, can be found through analysing relations between the five factors (human biology, social justice, environmental destruction, artefacts, and human consciousness). This can be exemplified with a reflection on the different societies as described by Le Guin and the different scientific perspectives on the Anthropocene.

An important difference between the two societies can be found in their contrasting understandings of a particular human nature. The Urrasti perceive their greediness as being the outcome of human biology, while the Anarresti relate this greediness to a particular consciousness of the Urrasti.

According to the natural narrative of the Anthropocene, environmental destruction is caused by humanity due to its human nature: or more precisely human's ability to make fire that led to the inventive fossil-fuel-burning human (Steffen et al. 2011b). However, this (hi)story in which human nature is understood as the cause of environmental destruction, is unable to question relations between social injustice and environmental destruction (Malm and Hornborg 2014), and sees technological progress as the salvation of humanity (Crutzen 2002). This perception in which humanity because of its human nature is destructive to the environment can be identified in Le Guin's visualisation of Urras.

To prevent for environmental destruction the Urrasti rely on natural scientists, technology, and regulation. Excess, property, and status continue to be significant, and environmental challenges are overcome by generating power with nuclear fusion plants, and environmental destructive activities are heavily taxed and

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[31] In which the 'laws of man' refers to a human nature of greed, selfishness, individuality.

regulated. Natural scientists on Urras are in charge of properly governing the economy in which growth is desirable. But, natural scientists lack the tools of social scientists to deal with the social dimension of environmental destruction, as social scientist criticise the natural narrative. Le Guin draws on Marxist theory to describe how social injustice is not challenged on Urras, and that environmental load displacement and unequal ecological exchange with Anarres continues.

The Anarresti, contrary to the Urrasti, believe that the greediness of the 'Urrasti nature' is much more related to human consciousness than to human biology. That is to say, to understand particularities of an assumed human nature, it is also needed to understand societal structures. This perception is shared with eco-Marxists. As Hornborg explains: "our entry into the Anthropocene does not refer to the biological properties of the species *Homo sapiens*, but to a specific form of social organisation that emerged very recently in human history" (Hornborg 2015: 61 [emphasis in original]). Eco-Marxists acknowledge that it is unique to human species to establish a social organisation like the capitalist world-system that is prerequisite to environmental destruction and social inequality, but it is not a necessary outcome of its human nature determined by human biology as the natural narrative implicitly suggests (Malm and Hornborg 2014). To them, the solution lies in challenging particular societal structures to prevent environmental destruction and social injustice. And so did the Anarresti, who liberated themselves from the historical social relations embedded in a propertarian economy. It is civil society that prevents for environmental destruction. The Anarresti feel responsible to take care of the environment because they adhere a social conscience based on justice, taking care of each other, and maintaining a balanced relationship to the environment (Le Guin 2006 [1974]).

3.9 Social justice and ecological sustainability on Anarres

Le Guin questions, by drawing on social science critique and Marxist theory, the freedom and progress that the Urrasti experience. She describes how freedom and progress are only achieved through unequal (ecological) exchange causing environmental load displacement. Social and environmental justice are absent. The Urrasti society can sustain 'affluent' lifestyles for some, but only at the expense of others. And maybe the freedom they experience is not as real as they think: they all look anxious, worried about making more and are ruled by rivalry (Le Guin 2006 [1974]: 299). Shevek experiences no real freedom on Urras as he does experience it on Anarres. On Anarres people are free because there is no possession, but on Urras people are possessed because they are possessors (Le Guin 2006 [1974]: 328). Odo was overly aware of this and she started a revolution for justice, for human solidarity, for freedom, and to seek the end of power. This led to the establishment of Abbenay on Anarres, a society based on a different consciousness. A society that is imagined as a desirable alternative to the unjust society on Urras.

3.9.1 Abbenay: a different consciousness

Imagine, there is no money, no power, no property. Everyone is equal to each other and although life is not always easy, there is love, solidarity, and care. If these are the fundaments of a society, how does such a society look like? The Odonians liberated themselves through a revolution from the social norms, beliefs, values and structures on Urras and build up an alternative society on Anarres. Odo herself never lived on Anarres but founded an alternative society in which justice is central. She called it *The Social Organism* (Le Guin 2006 [1974]: 147). The social organism is organised bottom up through human solidarity, brotherhood, social conscience, sharing, communal life, commons and mutual aid. They believe that it is about the ends not the means, about fulfilment and circularity.

These norms and values trickle down in education systems, work, housing, family life, social relations, motivation, happiness, language. The relation of humans to the environment is one of care: they do not fish too greedily and fertilise their land with organic wastes, all by hand (Le Guin 2006 [1974]: 269). Work is organised following first and foremost the principle of fairness, not efficiency: if there is no money real incentives to do work become present. Also social control together with the principal that "[o]ne's own pleasure, and the respect of one's fellows" makes people feel responsible to share the work and create a liveable place of justice for everyone (Le Guin 2006 [1974]: 218-219).

Anarres is about freedom:

> "We have nothing but our freedom. We have nothing to give you but your own freedom. We have no law but the single principle of mutual aid between individuals. We have no government but the single principle of free association. We have no states, no nations, no presidents, no premiers, no chiefs, no generals, no bosses, no bankers, no landlords, no wages, no charity, no police, no soldiers, no wars. Nor do we have much else. We are sharers, not owners. We are not prosperous. None of us is rich. None of us is powerful. If it is Anarres you want, if it is the future you seek, then I tell you that you must come to it with empty hands. You must come to it alone, and naked, as the child comes into the world, into his future, without any past, without any property, wholly dependent on other people for his life. You cannot take what you have not given, and you must give yourself. You cannot buy the Revolution. You cannot make the Revolution. You can only be the Revolution. It is in your spirit, or it is nowhere."
>
> (Le Guin 2006 [1974]: 426-427)

3.10 An ecological revolution on Anarres

By providing a Utopia, Le Guin shows how on Anarres, a society without a propertarian economy, no separation between consumption and production, no profit, no hierarchy, no exploitation, and without an unsustainable social metabolism; social power can be redistributed and egalitarian modes of production can

free humans from repressive institutions and alienating dominations.[32] An ecological revolution is accomplished. This, however, is different on Urras, they did, change their relation to nature, when compared to Terra, its material dimension, but they did not change their consciousness of nature. On Urras a modern perception on human-nature relations based on an ontological distinction can still be identified. An ecological revolution has not been achieved, and social injustice is not challenged.

The novel shows a thought experiment of Le Guin. She visualises how important a certain worldview is for understanding environmental destruction in relation to social injustice. In changing one's worldview lies the potential to fulfil an ecological revolution. As long as the modern worldview is not challenged only some environmental problems will be solved, it will lead to ecological sustainability at some places, and only in its material dimension. And as Le Guin, drawing on Marxist theory, reflects, it can be questioned whether this will ever lead to a world of social justice or long-term sustainability. The different worldview of the Anarresti reveals the fundaments of an alternative society in which social justice and ecological harmony are possible.

By conducting an ecocriticism, I opened up the debate between different environmental perspectives that are visualised by Le Guin in *The Dispossessed*. I analysed how useful a certain perspective is to bring about ecological sustainability and social justice. This analysis shows how science fiction can be useful to envision and critically assess alternative societies in the form of a dialectical utopia. Experimenting with visions of plausible alternatives has the potential to, on the one hand, be critical to current societal structures, and, on the other hand, to imagine desirable alternative societies.

This thesis has discussed the interrelatedness of environmental destruction, social injustice, human biology, artefacts and human consciousness, and some assumptions about these relations that seem to underlie different strands of socio-ecological theory, competing narratives of the Anthropocene, and the worldviews projected into Ursula Le Guin's science fiction. For me the next question is whether we have the potential to begin our own ecological revolution by abandoning the devastating Anthropocene (or Capitalocene) and freeing ourselves from its illusory definition of progress?

3.11 A final message

One of the most important messages of *The Dispossessed* is that change is freedom, and that even on Anarres societal structures need to be continuously challenged, instead of just reproducing Odo's thoughts without ever questioning them (Le Guin 2006 [1974]: 242-244).

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[32] As the scope of this thesis is not unlimited I do not have time nor space to make an extensive analysis of the societal structures on Anarres. Therefore I would highly recommend you to read this novel to critically explore the different societies yourself and find out what societal structures you prefer — which of course can also be a combination of norms and values from different societies.

Nevertheless, like Shevek, I question if it is defensible to organise an alternative society that remains connected to the hegemonic structures that are challenged, as inequities may simply be displaced to other places outside your own lifeworld.

> "The Settlers of Anarres had turned their backs on the Old World and its past, opted for the future only. But as surely as the future becomes the past, the past becomes the future. To deny is not to achieve. The Odonians who left Urras had been wrong, wrong in their desperate courage, to deny their history, to forgo the possibility of return. The explorer who will not come back or send back his ships to tell his tale is not an explorer, only an adventurer, and his sons are born in exile."
>
> (Le Guin 2006 [1974]: 135-136)

We might learn from the Anarresti and our own history, as the past is part of the future. We can do this by rewriting dominant historiography and choosing the story we want to tell in the Anthropocene. I know which story I would choose and fight for. It is up to each one of us to choose the story we find most appropriate, keeping in mind that we now live in a warming and highly unequal world.[33]

3.12 Remarks and limitations

Anarres is just one possible alternative to the societies in which we live today. Adopting Odo's ideas without questioning them would be foolish. Rather than providing a blueprint for a Utopia, we need critical scrutiny, creativity, and imagination to visualise alternatives, so that we can escape from the depoliticised and naturalised structures of injustice and environmental destruction that are currently reinforced through the 'natural' narrative of the Anthropocene.

The story of *The Dispossessed* is not written by Le Guin as a critique of the Anthropocene narrative, nor does the contrast between Urras and Anarres perfectly reflect the contrast between an ecomodernist solution versus an eco-Marxist alternative. But the story does help us imagine more or less desirable futures by raising questions about relations among the five factors. This can help us in the important work of envisaging utopias.

Anarres demonstrates more similarities with eco-Marxist concerns than posthumanist concerns. This can be explained by the different characteristics of these scientific traditions. Eco-Marxists challenge the historical, material, and social relations of production on which societies are built. They focus on the macro-level and have a clear political program. Posthumanists, on the other hand, focus on the micro-level and it therefore is less clear if they advocate any political alternatives. Nevertheless, posthumanist values are present on

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[33] See Anil Agarwal and Sunita Narain *Global Warming in an Unequal World: A Case of Environmental Colonialism* (Agarwal and Narain 1996).

Anarres and shared with eco-Marxists. Therefore, I do not want to conclude that the contrasts between Urras and Anarres only raise eco-Marxist concerns, nor that Anarres is the embodiment of an eco-Marxist utopia, and I do not want to position Le Guin herself in the eco-Marxist tradition. Posthumanist thoughts are not absent in Le Guin's novels. In other passages and novels, Le Guin experiments with posthumanist thoughts, as is evident in the following examples:

3.12.1 Dissolving dualisms

The ambisexuality of Karhides fascinates and confuses outsiders, but it structures the society of the Gethens and influences the subjects of their stories. If there are no binaries, what does this do to society? This is one of the questions that is raised in the novel: "In fact the whole tendency to dualism that pervades human thinking may be found to be lessened, or changed, on Winter." (Le Guin 2000 [1969]: 110-112)[34]

3.12.2 Kinship

On Anarres there are no large animals at all. When Shevek sees a horse he is curious, but his thoughts directly go to Takver — the woman with whom he shares his life and has children[35] — and he wonders what this would have meant to her, as "[s]he had always known that all lives are in common, rejoicing in her kinship to the fish in the tanks of her laboratories, seeking the experience of existences outside the human boundary" (Le Guin 2006 [1974]: 43).

> "Her concern with landscapes and living creatures was passionate. This concern, feebly called 'love of nature,' seemed to Shevek to be something much broader than love. There are souls, he thought, whose umbilicus has never been cut. They never got weaned from the universe. They do not understand death as an enemy; they look forward to rotting and turning into humus. It was strange to see Takver take a leaf into her hand, or even a rock. She became an extension of it, it of her."
>
> (Le Guin 2006 [1974]: 267-268)

Takver's view of other species is similar to Haraway's multispecies justice, in which she calls upon humanity to make kin with all the other organic species and abiotic actors with which we co-inhabit the world (Haraway 2015). When she thinks of a place full of animals as on Urras she dreams about how great this must be and how much you would feel part of other creatures (Le Guin 2006 [1974]: 269). The attitudes of the Urrasti, on the other hand, show that they feel everything but part of nature and the realm of animals.

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[34] This passage comes from the novel *The Left Hand of Darkness*. Initially I considered using this novel to illustrate a society built on posthuman thought, because of the central aspects of dissolving dualisms and the Gethens being a hybrid species, demonstrating similarities to Haraway's cyborgs (Haraway 2004).

[35] On Anarres there are no marriages, only partnerships. Speaking about 'my wife' or 'my husband' suggests a sign of possession, whereas partnership should be a voluntarily constituted federation, not an institution (Le Guin 2006 [1974]: 288, 350).

Animals are to be used for food, clothing, and pets, and nature is there to enjoy. Takver's view, like posthumanism, goes further than merely aesthetic love for nature and suggests an animistic ontology in which humans are part of the organic realm rather than opposed to or separated from it (Soper 1995). Even on Anarres, Takver's view is not the dominant one[36] and thus does not shape societal relations. On Anarres humans are understood as being different but part of nature. They thus make an analytical distinction between humans and nature. Reflections on variation within a society by means of science fiction can help us understand issues like this.

Conclusion

In this thesis I have shown how dependent on the official narrative a socio-ecological reality like the Anthropocene is given. This reality is a combination of facts and ideologies (Haraway 2003: 27). Stories can help us give meaning to the era of the Anthropocene in its historical, current, and future appearance. Through an explanatory critique of the Anthropocene phenomenon I analysed different narratives and stories. This enabled me to assess what scientific perspective is most conducive to understanding the relation between social justice and ecological sustainability in the Anthropocene. I also provided a thought experiment about its future using science fiction novels. I approached the questions by discussing various assumptions about the relations among human biology, social injustice, environmental destruction, artefacts, and human consciousness.

First of all I showed the dangers of the 'natural' approach underlying ecomodernism as the way forward in the Anthropocene. Together with many green and leftist social scientists, I believe that justice is important to strive for in order to increase social well-being and sustainability. This means that other stories than the natural narrative of the Anthropocene should be told. On the other hand, modern social sciences are not adequate to deal with issues in which the social and natural are deeply intertwined, as they are built on a strict separation between the social and the natural. These shortcomings have led to the emergence of new socio-ecological schools of thought such as posthumanism and eco-Marxism. Based on their perspectives, the shortcomings of the natural, ecomodernist story of the Anthropocene and some of the limits of modern social sciences are revealed. On the one hand, there is the posthumanist narrative, in which dualisms are resolved and the distinction between human and nature becomes obsolete. Posthumanists argue for a politics beyond the human. On the other hand, the eco-Marxist story of the Capitalocene understands the geological changes from a historical-material perspective, as generated by unequal social relations within a world-system regulated by capital, instead of by a uniform human species.

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[36] Anaresti have moral prejudices towards meat consumption — but we should not forget that there are no animals on Anarres, so being vegetarian is a given (Le Guin 2006 [1974]: 196).

This analysis attempts to answer the question of what scientific perspective we need to understand the causes of social injustice and environmental destruction, and to offer solutions for social justice and ecological sustainability in the Anthropocene. First, we need critical socio-ecological theory that is able to deal with intertwined social and natural relations, and that can bring in normative questions of justice and inequality into the Anthropocene story. Posthumanism and eco-Marxism do attempt to provide alternatives but are fundamentally incompatible and the discussion between these schools of thought continues. This shows that there is not one socio-ecological theory but rather different perspectives on how to understand the intertwinement of the social and the natural.

Second, as regards the relation between social justice and ecological sustainability in the Anthropocene, and challenging the 'natural' narrative and ecomodernist solutions, the story of the Capitalocene appears to be more useful, due to its political character and its focus on power, macro-structures, and the acknowledgement of human exceptionality. According to an eco-Marxist approach, responsibility with regard to environmental destruction and social inequality can be assigned to specific fossil-fuel-burning humans in a capitalist world-system. As shown, a posthumanist analysis, in downplaying the differences between humans and non-humans, is more likely to embrace ecomodernist visions of a 'good Anthropocene'. Such visions, according to a historical materialist approach, as suggested by eco-Marxists, would reinforce current societal structures that generate environmental destruction and social injustices. Instead, these macro-structures or social relations have to be challenged and civil society should regain influence over the industries, oligarchies and other powerful actors.

Step four of the explanatory critique is about providing alternatives, and thus a mere critique of the natural narrative is not enough. Through an ecocriticism of the novel *The Dispossessed* I showed how utopian science fiction can help us to envision and critically assess future alternative societies with more justice and ecological sustainability (a dialectical utopia). Through a re-imagination of society I analysed how a certain worldview is connected to social justice and ecological sustainability. I suggested that an ecological revolution has taken place among the people of Anarres, and that their different worldview contributes to social justice and ecological sustainability.

Overall, I conclude that critical socio-ecological theory can deal with questions that involve both the natural and the social, and can question the hegemonic structures of society — e.g. the dominant natural narrative — by bringing in the social, normative, and moral dimension to understand geological changes. This is crucial in order to understand how the social and natural are intertwined, and how the social and the natural as well as issues of justice can and should be part of the history that is narrated in the Anthropocene. Socio-ecological theory is important to understand what the Anthropocene currently is about and what solutions we need. Especially eco-Marxism may be useful in understanding the relation between social justice and ecological sustainability. Science fiction has the potential to imagine alternative, more or less plausible

futures of the Anthropocene, as it has the potential to critically question destructive societal structures and to experiment with visions of plausible alternatives in the form of utopias founded on completely different worldviews.

Maybe the most important lesson I learned from writing this thesis is that "*freedom is never very safe*" (Le Guin 2006 [1974]: 545) and that, for this reason, we should never stop questioning the social structures around us. Therefore, I conclude that in the Anthropocene a call for continuous critical scrutiny of the dominant structure of society and the stories told about it is what we need. We need debate and new visions and to keep on questioning the story we live in. Even on Anarres the manifestation of an anarchist society shows that a certain form of power is still present, endangering justice and well-being. Ideas have to be understood as existing in changing environments, rather than as static or ever-lasting. Or as Takver reassures Shevek:

> "If our society is settling down into politics and power seeking, then we'll get out, we'll go make an Anarres beyond Anarres, a new beginning."
>
> (Le Guin 2006 [1974]: 276)

The term Anthropocene may be an inappropriate one that we should discard as soon as possible, but the debate and speculation about alternatives should continue. Right now is the time to think about alternative stories as the Anthropocene story is contested and can still be rewritten. If we want to take away the fear to step out of the modern story, which is socially unjust and ecologically unsustainable, and to actually step into an alternative story, we need to visualise more imaginaries. This can be the beginning of our own ecological revolution.

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