MASTER THESIS

NATURAL HISTORY MUSEUMS, NONHUMANS & THE ANTHROPOCENE: EXPLORING HUMAN-NONHUMAN RELATIONSHIPS IN THE ANTHROPOCENE

Name: Raika Scherer, 529885
Supervisor: Dorus Hoebink
Word count: 27308

Place, Culture and Tourism
Erasmus School of History, Culture and Communication
Erasmus University Rotterdam

June 12th, 2020

ABSTRACT

Since the emergence of natural history museums during the Enlightenment they have studied and displayed the biodiversity of the Earth system. Today, this biodiversity and life on Earth are threatened by the destructive agency of humankind that caused numerous environmental challenges, as well as habitat loss and extinction of many creatures. The recognition of the irreversible impact of humanity on its environment has given rise to the term *Anthropocene* as naming for the current geological epoch but also as a conceptional term that gathers challenging implications of scientific, social, and cultural relevance. The related discourse is drawing attention to the importance of a profound re-thinking of human-nonhuman relationships and questions the wholeness and adequacy of modernist dualistic perspectives to tackle current environmental issues.

This master thesis explores how this new discourse has entered natural history museums, by analyzing the way museum professionals reflect on humans, nonhumans, and their mutual relationship in the context of the main concepts of the Anthropocene discourse. In-depth insights of curators, directors and public engagement managers of thirteen natural history museums have been gathered through semi-structured interviews

The findings of the research show that the Anthropocene discourse noticeably shapes the current presentation of and reflection on human-nonhuman relationships in natural history museums. Museum professionals increasingly start to consider social, political, and ethical questions where previously natural history display was limited to the field of natural science research. At the same time, the study has found that there are inherent characteristics of natural history museums and the way they approach human-nonhuman relationships – such as the notion of conceptual equity of all creatures - that hold a great potential to contribute to the Anthropocene discourse themselves. Even more, their position at the intersection of science and the broader public makes natural history museums important advocates for a mutual and respectful relationship between human and nonhuman beings.

KEYWORDS: *Anthropocene, Natural History Museums, Museum Practice, Human-Nonhuman Relationships, Indigenous Knowledge*

Table of Contents

1. INTRODUCTION

"Humankind is revealed as simultaneously insignificant and utterly dominant in the grand scheme of life on Earth by a groundbreaking new assessment of all life on the planet"

The Guardian
(Carrington, 2018)

Loss of biodiversity, global warming, plastic waste pollution, the constant reduction of air quality – and many more. Despite representing only 0.01% out of all living things on earth (Carrington, 2018), the pervasive impact of humankind on the planetary system is ubiquitous and ever-increasing. This human impact is so profound that in 2002 the atmospheric chemist Paul J. Crutzen (2002) proposed the term *Anthropocene* to name the current geological epoch and acknowledge humanity as a formative geological force. Even though widely discussed, this new term soon became established in natural sciences, but even more so in social sciences (see for instance Alberti et al., 2011, p.896; Möllers, 2013, p.57) and the public media (see for instance Carrington, 2016; Gee & Anguiano, 2020; Sharp & Foster, 2019) as a cultural and conceptional term that refers to humanity's impact on its natural environment. In this sense, the Anthropocene discourse serves as a framework to re-think the narrative of the Earth history, the natural environment, and humanity.

By putting humankind's agency and its impact on the nonhuman environment right in the center of attention, the Anthropocene is challenging theoretical assumptions and frameworks that have long treated humanity and the rest of the world as two distinct entities – and divided the academic world into natural sciences and humanities. To tackle the urgent questions of the Anthropocene, it is necessary to leave traditional disciplinary boundaries behind and re-think the systems in which we think about the world. In other words, as the social and moral agency of humans has led to humanity being a significant geological and ecological force, natural sciences can no longer continue to only deal with the "natural" or biological side of humans. At the same time, the humanities cannot leave out the environment and "nature" anymore when talking about humans (Latour, 2014a).

The term Anthropocene serves hereby as an assemblage for various current and challenging questions, ranging from scientific, social, and cultural ones to underlying ethical and philosophical considerations. From the effects of plastic waste pollution on the environment (Davis, 2015) to meat consumption (McGregor & Houston, 2018) or the influence of massive fuel consumption on the Earth system (Dalby, 2020) - in the end, it comes down to the acknowledgment of the profound and irrevocably interwovenness of humankind and its environment.

Moreover, the consciousness of living in the Anthropocene is often understood as a wake-up call, declaring an ecological crisis, and providing an opportunity to start more considerate and respectful ways of speaking about and dealing with the nonhuman environment (see for instance ICOM NATHIST,

2016; Marquardt, 2019, p.200). These notions of urgency and the necessity to address humanity's relationship to nonhuman beings draws attention especially to natural history museums.

This has several reasons. First of all, because they are museums. Naturally, museums are important public institutions for distributing and shaping knowledge, which puts them in a key position to make this rather complex project of understanding the Anthropocene transparent to the public (Cameron, 2005). As it is argued by Möllers (2013), it is especially the three-dimensional exhibition space of museums that helps to circumvent mental barriers and therefore allows visitors to develop helpful skills to think with an "Anthropocene perspective" (ibid., p.58). Similarly, Preziosi and Farago (2004) emphasize in their well-known anthology, *Grasping the World: The Idea of the Museum,* that museums are expected to "satisfactorily ground, establish, and transform our individual and collective lives" (Preziosi & Farago, 2004, p.1). In that sense, museums are considered the ideal space not only to be a multiplier for the Anthropocene's call for action but at the same time to actively encourage a transformation of individual and collective life.

While this already explains the key role of museums in general, it is especially natural history museums that cannot disregard the notions of the Anthropocene as they are explicitly dedicated to displaying and interpreting the natural and nonhuman world. Moreover, as scholars begin to acknowledge that the notions of the Anthropocene are fundamentally challenging the understanding of natural and human history as two distinct fields (Eagle, 2016), this poses quite some interesting implications and considerations for museums of natural history. In the words of Nicole Heller - the "world's first curator of the Anthropocene" (Bittel, 2018) at the Carnegie Museum of Natural History - there is "a new urgency to reinterpret the relationships between nature and humans, and investigate collections in novel ways, to create understanding and pathways for improved sustainability and equity" (Heller, 2018).

The field of natural history museums - including both museum practitioners and researchers as well as the related academic studies - has recently seen some forward-looking publications in this regard. The anthology *The Future of Natural History Museums*, edited by the former director of the Carnegie Museum of Natural History Eric Dorfman (2018), encompasses contributions of numerous museum professionals and takes a close look from various angles at how natural history museums can, might, and should shape their future practices and roles within the field of museums, society and the Anthropocene. The Anthropocene is also a dominant theme in the book *Curating the Future: Museums, Communities and Climate Change*, edited by Jennifer Newell, Libby Robin, and Kirsten Wehner (2017), which is tackling the interconnection of climate change and cultural identity by discussing practical museum experience and detailed projects and focuses on the relationship of museums with environmental challenges, Indigenous peoples and community.

Thus, it is to say that the field of natural history museums is noticeably starting to reflect on the role of the Anthropocene for natural history practice, be it explicit or implicit, as well as the other way around. The sometimes quite diffuse notions of the naming of the new geological epoch are approached from many angles and connected to museums' missions, public engagement goals, and societal relevance.

However, the research at hand aims to take a step back and start at the very heart of the Anthropocene discourse, namely the constitution of human-nonhuman relationships. By zooming in on the way museum professionals are currently perceiving and displaying nonhuman beings, this research seeks to investigate and evaluate in which ways the Anthropocene discourse has reached natural history museums. While the mentioned forward-looking anthologies provide valuable insights on how natural history museums could and should make use of the Anthropocene discourse in the future, it is to consider that they reflect the considerations of single progressive professionals and institutions. By analyzing human-nonhuman relationships at both, museums that do explicitly address the Anthropocene and museums that do not, this master thesis aims to provide a broader perspective of the encounter of natural history museums and the Anthropocene. Given the novelty of the discourse, the insights of curators, directors and other museum professionals play a key role within the research's objective. This is, because they are important protagonists who shape the way a museum is conveying knowledge and define its mission. The research question of this master thesis reads therefore as follows: *How do natural history museum professionals present and reflect on human-nonhuman relationships in the light of the Anthropocene discourse?*

The question of how museum professionals "present" human-nonhuman relationships refers hereby to the way they talk about humans and nonhumans in various contexts and the underlying notions and assumptions that are hereby revealed. "Reflect", on the other side, addresses the way museum professionals are actively and critically reviewing their own and the museum's approach towards the display and discussion of human-nonhuman relationships.

As the Anthropocene discourse and its implications for the perception of human-nonhuman relationships are a quite recent discussion and need profound explanation on their own, the theoretical framework of this research is divided into two chapters – unlike other master theses. Chapter 2 provides the conceptional framework of the current discourse on human-nonhuman relationships and its connection to the Anthropocene. Chapter 3 then outlines current developments at natural history museums that are relevant to the discussion of human-nonhuman relationships and the Anthropocene discourse.

Thereafter, the methodological framework, the inquired sample, and the process of data collection and analysis will be presented in chapter 4. In a qualitative approach thirteen museum professionals

were interviewed in semi-structured interviews to achieve in-depth insights on the intersection of the Anthropocene discourse and human-nonhuman relationships in natural history museums.

The findings of the research are presented in chapter 5. Preluding, section 5.1. traces current notions of change at natural history museums and locates the Anthropocene discourse within. Thereafter, the main results on human-nonhuman relationships at natural history museums are structured along three themes. First, the museum professionals' reflections on the human side of this relationship will be explored in section 5.2. Subsequently, section 5.3. examines different facets of the way nonhumans are displayed and perceived in natural history museums. Finally, section 5.4. addresses the question of how natural history museum professionals deal with Indigenous knowledge and the insights this knowledge provides on human-nonhuman relationships and Anthropocene topics. Chapter 6 concludes by synthesizing theory and empirical findings and discussing the results' relevance for the practice of natural history museums and the Anthropocene discourse, as well as suggesting areas of further research.

2. HUMAN-NONHUMAN RELATIONSHIPS AND THE ANTHROPOCENE

Human-nonhuman relationships have been studied long before the upcoming of the discourse surrounding the Anthropocene. A broad range of disciplines has dealt with human-nonhuman encounters from various angles and driven by different motivations. Ranging from, the most obvious, the field of biology to research on animal sculptures and depictions in art history (Kawami, 1986) or studies on plant use (Bussmann & Sharon, 2006) – the number of approaches and the list of fields that are explicitly or implicitly touching upon humans' relationship to nonhumans are as endless as the manifestations of these interconnections themselves.

However, the recent years have brought some significant changes to the way how the relationship of human and nonhuman beings is approached. The new notions that are currently negotiated and associated with the conceptional term Anthropocene are influenced by developments from various fields (Nimmo, 2015). The theoretical contributions range from the deconstruction of the human-animal divide by critical animal studies (Best, Nocella, Kahn, Gigliotti & Kemmerer, 2007; Ohrem & Bartosch, 2017) to studies of anthropogenic stress on the ecosystem in the field of environmental ecology (Freedman, 1989) and the post-humanist impulse of the *ontological turn* in the social sciences (Holbraad & Pedersen, 2017; Kohn, 2015; Pedersen, 2011).

What characterizes these new approaches and distinguishes them from earlier ones is a profound re-thinking of the binary opposition *human versus nonhuman*, paired with the attempt to overcome anthropocentrism and simultaneously acknowledging the irreversible impact of humans on their nonhuman environment (section 2.1.). As it will be illustrated in section 2.2., this change in perspective is essentially informed by non-Western ontologies and their inherent potential to perceive - and consequently treat - nonhuman beings differently.

2.1. OVERCOMING DUALISMS

Academic approaches to understand human-nonhuman relationships were long determined by modernist Western thinking[1] that perceives the world as consisting of "a pervasive series of opposing dualisms that are considered to structure the world" (Harrison, 2013, p.205). This means the world was perceived as divided into binaries such as mind and matter, nature and culture, or human and nonhuman. Originating in post-Enlightenment, this dualistic worldview has not only shaped people's understanding of the world, and estranged human and nonhuman beings (Barker, 1998), but also

[1] Here, and throughout the master thesis, "Western thinking" is used as a term to summarize modernist Euro-American ontologies. In line with Harrison (2013, p.207), the author is aware of the reductionist notions but considers the term as useful to point out relevant differences of Western worldviews to others.

divided the academic world in natural sciences on the one side and humanities or social sciences on the other (Latour, 2014a).

Since then, postmodern theory and thinking has fundamentally challenged this dualistic division and claimed that modernist binaries are not sufficient to describe an interconnected world (see for instance Pálsson, 2006). Similarly, the emerging "Anthropocene perspective" (Möllers, 2013, p.58) questions the universality of concepts such as "nature" and calls for new, less anthropocentric and more equal practices of talking about all living and non-living beings on Earth (see for instance Ginn & Demeritt, 2009, pp.300-311).

For instance, the marine biologist Carl Safina argues in his newly published book *Becoming Wild: How Animal Cultures Raise Families, Create Beauty, and Achieve Peace* (2020), that "nonhuman culture has been hugely underestimated, to the detriment of both Homo sapiens and the creatures with whom we share Earth" (Safina, 2020, as cited in Hannibal, 2020, p.143). With his aim to decenter "the human", which is also reflected in his previous work (Safina, 2015), he is negating culture as a primarily human feature and investigates questions like "How does a whale find meaning in life?" and focuses on dimensions such as communication, beauty, and establishment of social structure in nonhuman life (Hannibal, 2020, p.143). Safina's approach is only one of many recent examples where previous conceptual divisions - like culture as related to humanity and nature related to nonhumans – are blurring.

However, there were other theoretical concepts before this Anthropocene perspective that strived to overcome the dualism and hierarchy of human-nonhuman relations. One of the most famous is the actor-network theory (ANT) which is, besides others, significantly influenced by sociologist Bruno Latour (1987, 1988)[2]. ANT offers a conceptual framework for, not only, sociology to deal with the nonhuman environment, materiality, and technology in a way that overcomes the hierarchy between human and nonhuman actors (Law, 2011, p.21). Thereby, it assumes a relationality in which all entities – be it human ones, nonhuman, technical or ecological ones – receive meaning in a materialistic-semantic network through the relationships they maintain with each other (Ritzer, 2005, p.1, also see Law, 2011). While this makes the analytical differentiation of humans and nonhumans obsolete it leaves out the articulation of value (Kohn, 2015, p.321; Law, 2011, p.31)[3]. According to Kohn, to truly "recognize and give dignity to multiple modes of existence, or ontologies" (Kohn, 2015, p.321) it is necessary to acknowledge and express the value of these modes of existence, or more general living

[2] See also the work of Michel Callon (1986) and John Law (1999)

[3] The resolution of conceptional dichotomies and the interconnection of multiple (human and nonhuman as well as materialistic and conceptional) agents is illustrated in the following example of Latour: „The smallest AIDS virus takes you from sex to the unconscious, then to Africa, tissue cultures, DNA and San Francisco, but the analysts, thinkers, journalists and decisionmakers will slice the delicate network traced by the virus for you into tidy compartments where you will find only science, only economy, only social phenomena, only local news, only sentiment, only sex…" (Latour, 1993, as cited in Rodseth, 2015, p.866).

and nonliving beings. Latour himself reflects on "Agency at the Time of the Anthropocene" and adds to his earlier concepts of agency: "[E]xistence and meaning are synonymous. *As long as they act, agents have meaning*" (Latour, 2014b, p.12)

One of the most influencing scholars in terms of acknowledging the meaning and agency of nonhuman beings is anthropologist Anna Lowenhaupt Tsing (2013, 2015). As her fundamental re-thinking of the perception of nonhuman beings is of great importance for the understanding of human-nonhuman relationships in the Anthropocene and subsequently the research question, it is valuable to take a closer look at her work on nonhuman agency and sociability.

In her compelling ethnography, *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins,* Tsing investigates the interconnection of capitalist human destruction and "collaborative survival within multispecies landscapes" by diving into the world of matsutake, the most valuable mushroom in the world that grows in human-disturbed forests and is embedded in an assemblage of commodity chains, industrial forests, Japanese gourmets and many more (Tsing, 2015, back cover).

By referring to the Anthropocene Tsing aims to tell "true stories" not only about the agency of human beings but equally of the agency of fungi and other nonhuman agents (Tsing, 2015, p.viii; see also Verinis, 2016). Tsing challenges the conventional categorizations and units that are usually consulted to talk about "the life of the forest" (Tsing, 2015, p.162). Instead of operating with established generic terms such as *species*, she seeks to understand historical action through the stories of individual protagonists - that means specific pine trees, oaks, and so on – which form larger units through the relationships they maintain with each other. She writes:

> My oaks, pines, and matsutake are thus not identical within their group; they spread and transform their storylines, like humans, in diaspora. […] I follow their spread, noticing the worlds they make. Rather than forming an assemblage because they are a certain "type", my oaks, pines, and matsutake become themselves in assemblage. (Tsing, 2015, p.162)

Tsing's thoughtful approach to talk about life on earth in times of capitalist destruction - as it happens to be in the epoch of humans - sheds a whole new light on the established – natural history - practices of categorizing the nonhuman world along exterior similarities rather than the interconnected and interrelated networks that they form. It raises the question of why the human world is believed to be manifested in social groups, communities, and mutual relationships while the same thinking is still very limited when it comes to trees, fungi or whales (see Kohn, 2013; Tsing, 2013). In her article "More-than-Human Sociality: A Call for Critical Description" Tsing claims that if *social* is understood as entangling relationships with significant others then nonhumans are clearly social with or without humans and sociality does not differ humans from nonhumans (Tsing, 2013, p.27).

2.2. Indigenous Knowledge Systems

The usage of the term Anthropocene faces critique mainly for two reasons. First, critics claim that is to anthropocentric and is not representing the entangled world as it was shown in the work of Tsing in section 2.1. In the words of anthropologist Donna Haraway, "[n]o species, not even our own arrogant one […], acts alone; assemblages of organic species and of abiotic actors make history, the evolutionary kind and the other kinds too" (Haraway, 2015, p.159). In this sense, while the Anthropocene discourse is eager to work for more equity between all of these actors, it might already be the anthropocentric name that makes it another human discourse about human impact on human habitat in order to save the human species. Haraway therefore proposes the alternative term Chthulucene[4] to emphasize interconnectivity and the entanglement of "more-than-human, other-than-human, inhuman, and human-as-humus" (ibid., p.160) in myriads of temporalities, spatialities and intra-active assemblages[5].

Second, the term Anthropocene is criticized for holding misleading socio-political implications (Marquardt, 2019, p.201). Namely, to picture humanity as a homogenous unity where all individuals are equally accountable for the impact on and destruction of the Earth system. Thus, it leaves out cultural, social, political and economic differences and inequalities all over the world and followingly speaks of *human* impact when in fact merely industrialized and wealthy countries hold the biggest share[6] (see for instance Biermann, 2016; Cole, 2019; Gan, Tsing, Swanson & Bubandt, 2017, p.3). Biermann et al. (2016, p.342) therefore call for a more localized, context-dependent and social understanding of the nuances of the Anthropocene.

Moreover, not only does the term hide these measurable differences in impact and accountability but, as it is argued by Marquardt (2019, pp.201-203) and others (Inoue & Moreira, 2016; Todd, 2016; Whyte, 2017), also the knowledge that is consulted to address Anthropocene challenges is not representative. Marquardt (2019, p.203) refers hereby to a lack of voices from the Global South or non-Western ways of knowing in the Anthropocene discourse. Others are highlighting the importance of including the perspective and knowledge of Indigenous people. Inoue & Moreira (2016), for instance, emphasize how the rising acknowledgment and recovery of Indigenous knowledge systems has played an key role in the current developments of identifying the inadequacy of the nature-human dichotomy.

[4] According to Haraway, the term "Chthulucene" is inspired by the Greek word "chtonios" which means "of, in, or under the earth and the seas" (Haraway, 2016, p.53).

[5] Other proposed terms for this new epoch include the self-explanatory Capitalocene (see Baer, 2017; Latour, 2014a, p.7) and Plantationocene (Haraway 2015, p.162), which refers to the immense social and environmental injustice caused by extractive and enclosed plantations.

[6] Biermann et al. (2016, p.342) note that according to the World Bank already in 2008 merely 20% of the world population has consumed 77% of all global goods and services.

The value of Indigenous knowledges systems[7] especially for questions of ecological and environmental responsibility has been outlined by many studies in the recent years (see for instance Butler & Menzies, 2007; Espeso-Molinero, Carlisle & Pastor-Alfonso, 2016; Murray, 2017). However, the professor of geography and tourism studies David A. Fennell (2008) shows in his article "Ecotourism an the Myth of Indigenous Stewardship" how many of these studies are likely to overdraw Indigenous people as some kind of untouchable "wise protectors" of their environment and as "ecological stewards" whose assumed traditional values and inherent environmental ethic make them a flagship example of how to co-exist with nature (Fennell, 2008, pp.130-145). Fennel argues that great parts of these studies do not consider differences in the historical and current context on the one hand, and the differing applicability of particular lifestyles in environments such as forest landscapes or megacities (Fennel, 2008, pp.140-144). Thus, these studies generalize and idealize Indigenous identity and knowledge where they originally wanted to create dialogue.

It is inevitable to be careful with these implications when talking about Indigenous knowledge systems. However, if the urgency of the challenges of the Anthropocene is taken seriously, it is equally inevitable to draw from all available knowledge and take all possible solutions into account (see for instance Jamir, 2020; Reitzenstein & Heilmann, 2020). Moreover, Indigenous people do not need to be intrinsic ecological stewards to rightfully claim to have their knowledge considered and treated equally and at eye level with other existing knowledge systems. It therefore raises the question in what sense, and if at all, the knowledge of Indigenous people is taken into account in the recent discussions about the Anthropocene and even more in the seek for solutions to tackle the urgent environmental challenges of our time.

In fact, as there is rising awareness for the need to leave the dualistic worldview or ontology, it is reasonable to take those knowledge systems seriously which draw from other ways of *being* in the world. Anthropological studies have long shown that there is a plurality of ontologies that hold quite different perceptions of, for instance, how human-nonhuman relations are manifested (see for instance Tsing, 2013; Viveiros de Castro, 1998, Kohn, 2007).

Moreover, the anthropologist Zoe Todd (2016) - who describes herself as Indigenous feminist - argues that the insights of the Anthropocene and the dissolution of modernist dualisms are new only to scientific discourses dominated by Western ontologies. She argues that Anthropocene topics like the interconnectivity of human-nonhuman relations or multiple ontologies have long been addressed by Indigenous thinkers and are crucial for many Indigenous peoples and society's understanding of the world (Todd, 2016, pp.12-16).

[7] In the respective literature, "Indigenous knowledge systems" are alternating referred to as „Indigenous knowledge (IK), [traditional ecological knowledge] TEK, local knowledge (LK)" (Butler & Menzies, 2007).

Even though there is a great variance among these *Other* ontologies they are often referred to as Indigenous ontologies as they mostly derive from Indigenous people and share important conceptual similarities (Harrison, 2013, pp.206-207; Todd, 2016, p.14). The empirical and theoretical work of Philippe Descola (2005) on different modes of existence shows that one major difference within these Indigenous ontologies is the way people perceive the distinction between their *self* and other human and nonhuman beings (Descola, 2013a, pp.14-16). Descola differentiates between animism, totemism and analogism as well as the Western ontology which he calls naturalism (ibid.; Figure 1). In animistic ontologies, for instance, humans share a similar kind of interiority or consciousness with nonhuman beings and their different modes of existence are caused only by a different kind of body or physicality (Descola, 2013b, p.197). Naturalism, on the other side, sees a universal physicality with differing interiorities (ibid., pp.259-301). In other words, humans and nonhumans are understood to have the same (biological) body whilst their "souls" or consciousness is fundamentally different.

Descola's ontological grid

ANIMISM + interiority - physicality	**TOTEMISM** + interiority + physicality
NATURALISM - interiority + physicality	**ANALOGISM** - interiority - physicality

+ shared **- distinct**

Figure 1: Descola's ontological grid. Adapted by the author from: Descola, P. (2013a). *Beyond nature and culture.* Chicago/London: The University of Chicago Press.

One of the most prominent scholars of this school of thought – the so-called *ontological turn* - is the Brazilian anthropologist Eduardo Viveiros de Castro, who introduced the conceptual frameworks of perspectivism and multinaturalism (Viveiros de Castro, 1998; see also Hollbraad & Pedersen, 2017, p.160; Kohn, 2015, p.312). Based on multiple ethnographical studies he argues that in Amerindian perspectivism human and nonhuman beings are ascribed the same consciousness or self-reflective personhood (Viveiros de Castro, 1998, pp.469-478). If taken seriously, this kind of perspectivism has fundamental consequences for the way nonhuman beings are perceived and treated.

Since the late 1990s, more and more scholars in the social sciences have called to take these other ways of being into account and consequently start to de-construct the idea of a universal nature and re-think the constitution of human-nonhuman relationships (Haraway, 2003; Holbraad & Pedersen, 2017, pp.5-7; Kohn, 2015, p.317).

When it comes to environmental issues and the ecological crisis, the value of taking other ontologies seriously has been identified by various scholars such as Deborah Bird Rose who studied how relationships between humans and nonhuman beings are organized by Aboriginal people in New South Wales. She found that the concept of kinship played a core role not only between humans but also between human and nonhuman beings and that these relationships are based on solidarity,

responsibility and care (Rose et. al., 2003, as cited in Harrison, 2013, p.211). This shows, how a different understanding of human-nonhuman relationships influences the way in which humans perceive and interact with their living and non-living environment and, in the consequence, how present issues like climate change, species extinction or other current topics of the Anthropocene are approached.

This principle of kinship as one that includes not only human but also nonhuman beings is also highlighted by Zoe Todd (2017). She reports how the Blackfoot elder, thinker and philosopher Leroy Little Bear called to include all kin in the discussion of environmental issues. While discussing water pollution of rivers he raised the question if the perspective of the fish that faces extinction has been considered and calls for a more holistic approach to water use. Todd emphasizes, that it is important to see Indigenous thinking "as not just a well of ideas to draw from but a body of thinking that is *living and practiced by people*" (Todd, 2016, p.17). Therefore, it is important to consult the Indigenous thinkers themselves instead of leaving the discourse to "the white supremacy" (Todd, 2016, p.18) of academia.

3. CURRENT DEVELOPMENTS AT NATURAL HISTORY MUSEUMS

In times past our invitation has been to come to the museum and escape into nature, albeit represented by specimens that have been shot and stuffed and constrained to a cabinet in a wood paneled hall.

Eric Dorfman, former director of the Carnegie Natural History Museum
(Dorfman, 2018, p.2)

When the Enlightenment and the associated dualistic thinking divided the academic world into natural and social sciences, it simultaneously gave rise to the development of natural history museums. From the 18th century onwards, the display of specimen and natural objects became increasingly categorized and classified and replaced the former Renaissance collections (Bennett, 1988, pp.87-90; Johnson, 2018, p.xviii). Therewith, natural history museums are not only "the children of the Enlightenment" (Johnson, 2018, p.xviii), as Kirk Johnson puts it, but have mutually fostered and manifested the understanding of "nature" as a distinct category.

Until 1930, natural history museums were primarily focused on the collection, sampling and research of specimens for scientific systematic purposes and taxonomic specimen-display (Rader & Cain, 2008). However, originating in the United States - and subsequently since the 1960s in Europe - natural history museums began to change towards a stronger focus on public engagement and experience (Bergdahl & Houltz, 2017, p.219; see also Harrison, 1993, p.167; Johnson, 2018, p.xviii; Miles, 2007, p.129-130). The following development is known under the term *New Museology* and was characterized by greater awareness for the political and societal relevance of museums and their role within communities (Borelli & Davis, 2012, p.33).

At the same time, the 1960s are considered the start of rising environmental consciousness and awareness of humanity's destructive impact on the Earth system (Bergdahl & Houltz, 2017, p.218). At this intersection of the New Museology and becoming aware of an environmental crisis, evolved the so-called ecomuseum movement (Borrelli & Davis, 2012, p.33; see also Davis, 2008). Having their roots in France, ecomuseums are defined as "a community-based museum or heritage project that supports sustainable development" (Davis, 2007, p.116) and strive to raise care and sensibility for the natural and cultural environment with local resources and among local actors (ibid., p.42; see also Harrison, 1993, p.166). As outlined by Borelli & Davis (2012), ecomuseum practices interpret the relationship of nature and culture fundamentally different than traditional natural history museums. Driven by a human-centered approach they foster a dynamic and interconnected understanding of a network of people, places, landscape and the "natural" world.

Therefore, the ecomuseum movement indicates that nature-focused museums have a strong potential to become a powerful voice for overcoming the manifested dualisms of nature-culture or

human-nonhuman. However, back in the 1960s natural history museums did not yet make use of it. Instead, as Johnson lines out, many natural history museums had "reached their nadir" (Johnson, 2018, p.xviii), closed or gave away their collections.

In 2002, the renowned physicist Leo P. Kadanoff reflected on the constitution of natural history museums and wondered why there is so little up-to-date science despite the museums being full of "vast and wonderful stores and displays of all kinds of preserved animals, plants, and human artifacts" (Kadanoff, 2002, p.273). "Why is there little discussion of pollution, extinction, or AIDS?", he asked (ibid., p.274).

Almost two decades on, these questions are not only at the heart of current discussions in the field of natural history museums but, even more, recent publications indicate that natural history museums are currently starting to substantially and broadly re-think their practices, themes, conceptual frameworks and missions (see for instance Dorfman, 2018; Möllers, 2013; Newell, Robin & Wehner, 2017). Natural history museums seem to have regained their powerful discursive voice and are experiencing a "revolutionary rebirth" (Johnson, 2018, xix).

Within this rebirth, next to other ongoing subjects such as transparency of natural history museum's research practice (Howarth, 2018), museum security (Pennock, 2018) and public engagement issues (Blond, 2018; Dufresne-Tassé & Pénicaud, 2018; Garthe, 2018), the theme of the Anthropocene with all of its implications, questions and challenges is omnipresent. Ranging from questions of how to deal with objects and collections from an Anthropocene perspective (Drew, 2017; Lacey, 2017; Norris, 2018; Stege, 2017) to natural history museums' role in addressing environmental topics (Blond, 2018; Rudiak-Gould, 2017) – there are multiple fields in which natural history museums are evaluating what the conceptual framework of the Anthropocene means for their museum practice, research and daily work. While some natural history museums have already started to actively talk about the Anthropocene and address it in exhibitions or on their websites[8], other museums are addressing associated topics such as climate change, without actively connecting it to the ongoing discourse[9]. This indicates that even if museums are not familiar with the theoretical discourse surrounding the Anthropocene, they still have connecting points to its content and implications.

The Anthropocene, as Blond (2018, p.110) puts it, has become a buzzword to bring global change, climate change and humans' role in it into the museums and make it a focus of exhibition content. For this reason, the International Committee for Museums and Collections of Natural History (ICOM NATHIST) has put the Anthropocene explicitly in the center of their annual meeting of 2017 (ICOM Österreich, 2017). With the participation of important stakeholders, such as directors of some of the

[8] See for instance the Natural History Museum London (2020a) or the Smithsonian National Museum of Natural History in Washington (Blond, 2018).

[9] See for instance the Swedish natural history museum Naturhistoriska riksmuseet (2020).

world's most important natural history museums, the conference "The Anthropocene: Natural History Museums in the Age of Humanity" examined the role of natural history museums in addressing and implementing the discussion surrounding the Anthropocene. In the conference report it is stated that natural history museums at the nexus of the diverse approaches to the Anthropocene and their interpretation for the public (ICOM NATHIST, 2017). Besides a wide diversity of approached topics during the conference that are meant to set "the stage for more work to come" (ibid.) the outputs of the conference involve a NATHIST Anthropocene working group and the launch of the book *The Future of Natural History Museums* (Dorfman, 2018), indicating that the field of natural history is currently in a state of transformation and reflection.

The comprehensive anthology with contributions from 23 museum practitioners and scholars is drawing the picture of "a new breed of institution, one that exists in the future" (Dorfman, 2018, p.1). Within this new kind of natural history museums, the Anthropocene plays quite a central and dominant role. In the introduction, Dorfman asks how the Anthropocene will structure the visitor's perceptions, how it will influence natural history research and how to reach a best practice in order to engage and educate visitors. He touches not only upon the need to create care and credibility for wildlife among the public but also reflects on the museum's responsibility to partner up with Indigenous peoples and include their stewardship and knowledge of dealing with the nonhuman world (ibid, p.2). The forward-looking contributions of *The Future of Natural History Museums* are combining theoretical reflections on the future of natural history museums on the one hand and are providing insight on their current practice and processes on the other hand.

Next to it, the anthology *Curating the Future: Museums, Communities and Climate Change*, edited by Jennifer Newell, Libby Robin and Kirsten Wehner (2017), is tackling the interconnection of climate change and cultural identity by discussing practical museum experience and detailed projects. Again, the challenges of the Anthropocene are a prominently discussed topic, with special focus on the relationship of museums with environmental challenges, Indigenous peoples and community.

The strong representation of curators among the authors of *Curating the Future* draws attention to the important role that curators hold in the discourse of natural history museums in the Anthropocene and how they significantly shape the way museums are approaching and communicating the notions of this new conceptional framework. Grande (2017, p.x) states that a curator's task is to convey a museum's message by disseminating knowledge with authority and originality. Moreover, he emphasizes how curators are "passionate about their quest for understanding the Earth and its people" (ibid.).

Having said that*, Curating the Future* traces the interplay of museums and the Anthropocene along four key trajectories: "building bridges across deep-seated separations between colonized and colonizer, Nature and Culture, local and global, authority and uncertainty" (Newell, Robin & Wehner,

2017, p.1). The thesis at hand, however, strives to contribute to this elaboration of museums in the Anthropocene by adding an analysis of another and underlying deep-seated separation by inquiring the research question of how natural history museums are displaying and reflecting on human-nonhuman relationships within this promising discourse surrounding the Anthropocene.

However, as outlined earlier this discourse is not only concerned with bridging these dualisms and starting to re-think human-nonhuman relationships with notions of interconnectivity and equity. Equally important is to thoughtfully reflect on where input and inspiration for this re-thinking could come from and expand the frontiers of the consulted knowledge. Or in the words of Newell, Robin & Wehner (2017, p.11), to "expand our sense of how we relate to the world" and welcome new voices to the field of natural history museums. This refers especially to the voices of Indigenous thinkers whose value has been illustrated above and who in many cases provided the groundwork for the present-day reflections on human's relationships with the nonhuman world (Todd, 2016).

The value of Indigenous ontologies for the field of museum and heritage studies has been emphasized by critical heritage scholar Rodney Harrison (2013, pp.204-226). He illustrates how Indigenous ontologies have already successfully challenged heritage concepts that were based on Western dualisms and subsequently sparked the valuable approach to address heritage as emerging from "the relationship between a range of human and non-human actors" (ibid., p.204). He goes on to explain how this taking seriously of other ontologies opens ways and methods for a more dialogical approach towards heritage (ibid., p.204-210).

Even more, in the light of the historic role of museums as participants of colonial practices through collecting and displaying Indigenous people in natural history museums it is to argue that they have a great responsibility to use their authoritative voice in favor of those who have historically suffered from being displayed as the Other and naturalized by exactly this authoritative voice (see for instance Lenoir & Ross, 1996; Newell, Robin & Wehner, 2017, pp.11-12; Teslow, 2014, pp.37-38). Rodriguez (2020) points out how the naturalization through displaying Indigenous people in natural history museums is among the most harmful and continuous effects of colonialization. Even more, she argues that the decolonialization efforts of natural history museums are way behind those of other institutions.

Additionally, the collections of Western natural history museums consist to great extent of objects that have been collected in non-Western countries. Norris notes that to truly achieve sustainability and talk about issues such as biodiversity loss there must be at least some leadership "from the countries that actually 'own' the biodiversity" (Norris, 2018, p.16). He lines out how it reveals already a lot, that out of thirty-nine authors who contributed to a prominent publication that called to address biodiversity, thirty-four were US based (Norris, 2018, p.17; see Wheeler et al., 2012). Therefore, the

following analysis will pay attention to the way current natural history museum professionals are aware of this imbalance and the importance to integrate Indigenous knowledge into their expertise.

4. METHODOLOGY

The master thesis at hand is concerned with the way the Anthropocene discourse shapes the presentation and representation of nonhumans and their relationship to humans in natural history museums. The strong representation of museum directors and curators within the few academic publications on the interplay of the Anthropocene and natural history museums is demonstrating the importance of museum professionals in this discourse (see for instance Dorfman, 2018; Newell, Robin & Wehner, 2017; Möllers, 2013). Considering this powerful voice of curators in disseminating and conveying the museums' knowledge and mission to a wider public, the research focuses on the reflections of museum practitioners on human-nonhuman relationships in natural history museums and the role of the Anthropocene within. Even more, as the discourse of the Anthropocene is a very recent one it is to assume that there are processes and discussions at natural history museums that are not yet visible in the current exhibitions or not yet officially communicated. Directors, curators, and other museum practitioners can provide insight into these internal discussions. Furthermore, their degree of awareness and reflection on the inquired topics provides an understanding of the future role of the Anthropocene discourse in natural history museums and their approach to human-nonhuman relationships. The research question, therefore, reads as follows: *How do natural history museum professionals present and reflect on human-nonhuman relationships in the light of the Anthropocene discourse?*

Given the open-ended nature of the research question and the aim to generate an in-depth understanding of how museum professionals think and talk about the Anthropocene and human-nonhuman relationships, a qualitative approach with semi-structured interviews has been chosen (Adler & Clark, 2011, pp. 268-269; Creswell & Creswell, 2018, pp. 43-44). From the end of January 2020 to the end of April 2020, interviews with twelve curators, directors, and public engagement managers from different natural history museums were conducted. The interviews lasted between 45 and 100 minutes each and summed up to a total of 13 hours and 36 minutes of data material.

Complementary to the interviews, the temporary exhibition "The Earth's Thin Skin – Our Soil" at the Naturkundemuseum Graz, Austria, as well as its permanent exhibition has been analyzed. The exhibition analysis followed the initial research plan that aimed not only to interview museum professionals but to complement these insights with an analysis of the implementation of Anthropocene topics and human-nonhuman relationships in the museums' exhibitions. Due to the enforced measures and restrictions regarding the coronavirus during the main research phase and the resulting closure of all inquired museums, no further exhibitions could be analyzed, and accordingly the research plan and method were adapted. Therefore, the findings of the exhibition analysis in Graz are treated as exemplifying or complementing insights to support the results of the main research

method. The exhibition was documented by taking photographs (see Appendix A3) which were then coded and analyzed together with the interviews, see below.

The respondents of the conducted interviews were selected through purposeful sampling to ensure that the study is informed by individuals who are especially experienced with or knowledgeable about the researched phenomenon (Palinkas et al., 2015, p. 534). More specifically, the sampling process followed two stages, starting with the selection of relevant natural history museums according to specific criteria and subsequently the identification of valuable interview partners within.

Informed by a review of the theoretical discussion surrounding the Anthropocene (see chapter 2) and preliminary desk research at international natural history museum websites, it was found that there are three categories of natural history museums at the intersection of Anthropocene topics and human-nonhuman relationships. The first category consists of museums that are explicitly communicating and engaging in the Anthropocene discourse on their websites, for instance through corresponding articles or the introduction of Anthropocene themed exhibitions. In the second category fall natural history museums that are not mentioning the Anthropocene by name but have either exhibitions and programs that fall into the field of Anthropocene topics – such as climate change and biodiversity loss – or exhibitions which address some specific aspects of human-nonhuman relationships. The third category consists of museums where neither the first nor the second criterion is applicable and no notions of the Anthropocene discourse or active reflections on human-nonhuman relationships are noticeable. Museums of the third category do meet the research interest as they do not provide insight on either natural history museums' approach to human-nonhuman relationships or the Anthropocene discourse. For further details on the concrete criteria – for instance, specific exhibitions – please see Appendix A2.

The final sample consists therefore of three natural history museums of the first category and ten museums of the second category. The reason for this imbalance in numbers is that to this day there is only a small number of natural history museums worldwide which are addressing the Anthropocene discourse explicitly. All but one of the museums are located in Europe. This is due to the research practicalities of the initial research plan. The required financial and time resources to analyze various exhibitions outside Europe would have exceeded the scope of a master thesis. The caused bias of this geographical selection has been reflected throughout the analysis process.

Subsequently to the sampling of natural history museums, the museum professionals were selected and approached based on their ability to inform the research question. That means, they hold either expertise on the implementation of Anthropocene topics in natural history museum practice or are involved in curating exhibitions that are relevant to the research topic. Exhibitions are considered relevant if they either explicitly mention the Anthropocene or clearly address human-nonhuman

relationships, for instance as human impact on the Earth system or comparisons of any aspect of the human and nonhuman world.

In a final step of sampling, when the first interviews were already conducted, recommendations by the respondents for further promising interviewees were considered. This snowball sampling (Bryman, 2012, p. 716) also resulted in including the Carnegie Museum of Natural History as the only non-European museum in the sampling. Please see Appendix A1 for an overview of all respondents and their positions within the museums.

The guideline for the semi-structured interviews was designed in a way that serves the variety of the respondents' expertise on the one hand and the different levels of awareness to theoretical discourse among the respondents on the other hand. As stated above, the research question does not only ask for the presentation of human-nonhuman relationships by museum professionals but also explicitly for their reflectiveness on this relationship and its connection to the Anthropocene. As especially the Anthropocene discourse is a quite novel phenomenon, it was not known beforehand to which degree natural history museums are already dealing with these issues internally and to what extend the interview respondents are aware of the underlying theoretical discourse. Therefore, it was crucial to first assess the respondent's degree of reflectiveness as well as her or his knowledge of the associated theoretical concepts. This, in order to formulate the follow-up questions in a way that they do not imply knowledge on theoretical concepts where it is not there but to stay able to ask more far-reaching questions when a respondent shows high levels of awareness of the concepts.

Thus, the interview guide (see Appendix B) consists of two main parts, operating at two levels of comprehension and building the framework for an individual set of questions for each interview. The first level aimed to examine the respondent's awareness to Anthropocene questions and, in line with the research question, especially its relevance to human-nonhuman relationships. Based on the preliminary desk research the questions of this first phase addressed general information and context of the exhibition(s) in question, the respondents' professional background, and, if applicable, the museum's mission. Not only is it considered already as valuable information itself when museum professionals themselves did – or did not – address topics of the theoretical discourse in the first phase, but this assessment was also important for the further progress of the interview. The follow-up questions were informed by the second part of the topic list which operationalized the theoretical discourse. Based on the earlier assessed level of awareness and knowledge of the theoretical concepts as well as in reaction to topics raised by the respondent, this second phase generated more concrete and in-depth insights about the respondents' reflections on specific aspects of the human-nonhuman relationships in the Anthropocene.

The preceding theoretical discussion (chapter 2) has illustrated that the intersection of the Anthropocene discourse, human-nonhuman relationships, and natural history museums synthesizes

multiple connotations, ranging from a call to address the destructive impact of human agency and the acknowledgment of nonhuman personhood to the understandings of the interconnectivity of all beings on Earth and the value of indigenous knowledge. To sufficiently answer the research question, the relevant concepts of this discourse have been translated into questions for the interview guide, as outlined in the following, which informed the main results of this master thesis.

One of the dominant themes in the Anthropocene discourse is the recognition that modernist dualisms are no longer adequate to describe the interconnected and entangled world. Even more, the need to overcome this binary thinking is emphasized. With natural history museums being at the center of this culture-nature and human-nonhuman divide, the interview questions aimed to catch the implicit standpoint of museum professionals on the one hand and provoke explicit reflections on this topic on the other hand. The latter was achieved by asking the respondents to explain their conception of "nature" when they used the term during the interview. The more implicit notions were investigated especially by prompting the respondents to talk about humans in natural history museums and observing if nature and human are used, for instance, as binary terms.

This is closely connected to Latour's (2014a) postulation that in the Anthropocene natural science can no longer reduce their perspective on humans to the "natural" or biological side. The corresponding interview questions aimed to explore if the same is true for natural history museums. To assess if and to what degree museum professionals identified social and moral agency of humans in special and permanent exhibitions, they were asked to describe in what ways or facets visitors would encounter humankind in specific exhibitions. If necessary, this question was subsequently narrowed down to human agency in specific and the respondent was asked to compare different exhibitions in this light.

When addressing questions of display and conceptualization of and perspectives on nonhumans, it was paid attention to use the term or phrase that the respondents had used themselves in the first assessment phase of the interview. For instance, if the respondent had used "species" to describe - parts of - the nonhuman world, the follow up-questions asked what kind of species are displayed at the museum, if there are any differences in mode of display or what message should be conveyed by displaying these species.

Finally, the interviews aimed to explore how museum professionals assess and perceive alternative knowledge systems and their value for natural history museums. The corresponding questions first asked if the museum and the exhibitions addressed Indigenous people in some way or the other. If necessary, a follow-up question asked more specifically about the implementation of *knowledge* and assessments of the value of this knowledge for natural history practice. For further details on the operationalization of the theoretical concepts, and exemplifying questions per category, see Appendix B.

In terms of data collection, the respondents were informed prior to the interview that the master thesis is concerned with the display of human-nonhuman relationships in natural history museums. The interviews were scheduled to take place at the natural history museums themselves in order to give the museum practitioners – as also frequently requested by the same - the possibility to illustrate and support their statements in situ with the actual exhibitions or collections (Sin, 2003). However, as the governmental measurements regarding Covid-19 came into operation during the main research phase, all but four interviews were conducted via video or phone call. Unfortunately, in some cases, this led to poor quality of the recorded audio files. The valuable interview with the head of exhibitions at the Natural History Museum of Denmark could therefore not be transcribed and used for this research. Furthermore, the senior researcher at Naturalis Leiden could not afford the time for an oral interview. As her expertise on indigenous knowledge was nevertheless considered highly relevant for the research a short interview in written form was conducted.

The transcription, organizing, and coding of the interviews were performed with the "Qualitative & Mixed Methods Data Analysis Tool MAXQDA" (MAXQDA, 2020). This analysis tool did not only increase the accessibility of the data but allowed to include the photographs of the exhibition analysis into the coding process. The coding process itself is informed by the method of thematic analysis (Nowell, Norris, White & Moules, 2017). In a first step, the raw data set was reviewed closely and repeatedly, and relevant text passages were assigned with preliminary codes to highlight specific characteristics of each interview. Three types of information revealed by the respondents were herby considered. First, statements of descriptive nature that reported, for instance, exhibition contents that are relevant for the analysis. Second, active reflections of the respondents on specific aspects of the relevant theoretical discourse. Third, underlying assumptions, implications, perspectives, or worldviews that are not distinctively expressed by the respondent, but which are reflected in, for instance, the choice of words, the presentation of a topic, or by omitting certain aspects in a statement. Subsequently, emerging themes and underlying patterns of the data set were identified. The codes were categorized into themes, connected to the relevant theoretical discourse, and revised for their relevance for the research question (King, 2004, as cited in Nowell et al., 2017, p. 6).

5. Humans and Nonhumans in Natural History Museums

5.1. Natural History Museums as Agents for Change

"On the brink of crisis and major global collapse, museums are, and need to be, agents for change"

Valine Crist from Haida Nation
at the ICOM NATHIST conference 2017
(Not an Alternative, 2019)

Natural history museums are changing. And they are just about to start. Throughout the course of this research, the notions of change were omnipresent. The driving force of this change is unmistakably the Anthropocene. More accurate, not the Anthropocene as such but the struggles, discourses, and thoughts that are gathered under the conceptional term Anthropocene.

"[I]t's a crisis", states Nicole Heller, Associate Curator of Anthropocene Studies for Carnegie Museum of Natural History, and goes on:

> And in responding to it, we really need to rethink our methods and think more holistically, more interdisciplinarily. And that's some of the genesis, right? Okay, we've got to do something different here.

To do something different. This seems to be a shared objective of especially bigger natural history museums who are actively and explicitly addressing the Anthropocene. Linda Gallé, curator at the natural history museum in Berlin attests:

> At the moment, there seems to be a wave of renewal at natural history museums. One realizes, this is some kind of a turning point. That is also about the buzzword Anthropocene, so the epoch of humans.[10]

However, the notions of change are neither limited to renowned and bigger natural history museums nor to the ones who are explicitly addressing the Anthropocene. Throughout all the natural history museums that have been inquired in the course of this research there were different levels of updating and change noticeable.

One level is the updating of current temporary or permanent exhibitions that are concerned with environmental issues. Claes Enger from the Swedish Museum of Natural History reports that the museum's 15-year old climate exhibition is currently under renovation to better include "all this about humans" and meaning to address politics, lifestyle and a call for action. Similarly, the Finnish Museum

[10] Translated form German by the author.

of Natural History is doing some updating on their climate change exhibition. Educational curator Anni Granroth explains how the staff is working to include issues of biodiversity loss, extinction and human impact in their climate change exhibition before going on to extend it to the permanent exhibitions as well. She emphasizes how “that's the biggest change that has been happening in five years now, that environmental educators have been started to more talking about the urgency and the changes that must happen in this generation, not the next one”.

Another level of updating and change is the development of fundamentally new museum projects. This is currently happening – or going to happen - in Copenhagen, Basel and Düsseldorf. These projects are strongly characterized by questions of environmental challenges, awareness for human impact and a call for action. Stefan Schweizer, director of the natural history museum in Düsseldorf, emphasizes how the upcoming new museum will combine heterogenous collections and focus much more on questions of equity between human and nonhuman beings as well as the cultural production of scientific knowledge and interconnectivity of collections. Similarly, the new museum project of the Natural History Museum of Denmark strives for a stronger interconnection of their collections in exhibitions and to talk about human impact on the planet while at the same time developing a more flexible exhibition concept to stay “updatable” in a changing world. Finally, the Natural History Museum Basel is working on a new concept to make scientific research processes and the collections themselves more transparent.

Especially interesting are the Natural History Museum London and the Carnegie Museum of Natural History in Pittsburgh, as out of the inquired natural history museums those are the only ones who have recently started to dedicate resources and positions explicitly to curating, working and thinking with the Anthropocene. Camilla Tham’s position as an Anthropocene Engagement Manager at the Natural History Museum London has only been created in summer 2019 in the context of the museum’s new launched strategy. Slightly earlier, the Carnegie Museum of Natural History has assigned Nicole Heller with the task to build a section of Anthropocene Studies. She works as a Curator of Anthropocene Studies for about two years now. However, both Tham and Heller emphasized how they are inspired and encouraged by colleagues from other natural history museums or related institutions which are undergoing similarly reflections and processes.

These current impulses of change are based on two complementary realizations by natural history museum professionals. First, environmental issues and other facets of the Anthropocene discourse are offering natural history museums the chance to strengthen their relevance for and engagement with the public. Second, the Anthropocene discourse is not only a chance for the museums but at the same time natural history museums have a great potential to contribute to the discourse and make it accessible for the public.

As most of the other respondents, Wolfgang Paill from the Natural History Museum Graz describes how it is part of the museum's mission to address topics of societal relevance. Similarly, Gallé emphasizes how the recent years have brought a development at the natural history museum in Berlin to open up much more to the public and indicates how the Anthropocene and the discussion of human-nonhuman relationships play a central role in this regard:

> We also feel a societal responsibility as museum. As a space where people discuss nature and also the relationship between humans and nature. [11]

While this has led, according to Gallé, to a significant increase in visitor numbers it also points at the second stand that natural history museums take when it comes to the Anthropocene. Namely, that the museums realized their great potential to contribute to the Anthropocene discourse, not only due to their expertise but also their reach and the widely perceived trustworthiness. Camilla Tham explains why she believes that natural history museums, and the Natural History Museum London in particular, are in an advantageous position to address Anthropocene issues and make them accessible for a broader public:

> We're trusted as a museum, and at a time of disinformation and confusion museums are very lucky because broadly they remain quite a trusted space. And we have scientific expertise. […] The collection is an amazing tool for understanding the history of life on earth and that will help us plan for the future. So, having that collection is one of our USPs, I guess. Having 300 scientists based at the museum is another amazing advantage we have. As a lot of scientific expertise. […] And the other thing […], we're so lucky that we have that chance to reach people both online and physically in our spaces, through our collections, and to tell amazing stories. We're very lucky to have that. It's an opportunity that we can't miss to really engage audiences with these very important issues.

It becomes evident, that beyond noticing the advantageous position of natural history museums there is also a strong notion of responsibility and necessity to talk about these issues. Heller states that "we have a big role to play in the Anthropocene" and points out to natural history museums' expertise and their inherent nexus of nature and culture.

This claim of natural history museums being in a unique position to foster the Anthropocene discourse is supported by prominent voices such as the Sant Director of the Smithsonian's National Museum of Natural History in Washington, Kirk Johnson, who writes that in the current days "natural

[11] Translated from German by the author.

history museums find themselves with a powerful mandate to understand the natural world and humanity's place in it" (Johnson, 2018, p.xix).

According to Tham, the Natural History Museum London takes this mandate even one step further. She states:

> And our mission is to create advocates for the planet. So, people who will speak up on behalf of nature and want to protect our natural systems for the greater good of humans, but for the rest of life on earth as well.

Now, how are natural history museum making use of this mandate? And what is their understanding of this relationship of humans and the rest of live on earth that they strive to pass on to their visitors and the broader public? How do they meet the theoretical considerations and reconceptualization that are called for by the Anthropocene discourse?

These are the questions that will be examined in the following sections. Section 5.2. will illustrate what it means for natural history museums to start talking about the human role and human agency in the first place. Subsequently, it will be analyzed in section 5.3. what this means for the display and treatment of nonhuman beings in natural history museums. Finally, section 5.4. discusses if and in what ways natural history museums are considering Other knowledge systems that are promising for the mission of re-thinking human-nonhuman relationships. All this, as it will become evident, is closely connected, inspired and influenced by the discourse surrounding the Anthropocene.

5.2. Talking About Humans

5.2.1. De-naturalizing Human Beings

First, the very idea of the Anthropocene places the "human agency" (still undifferentiated, taken en bloc and generically) smack in the center of attention.

Bruno Latour
(Latour, 2014a, p.2)

The human has long been a part of natural history museum's exhibitions. However, on the one hand it was mainly limited to the display of human remains or objects. On the other hand, it mostly referred to humans who were either perceived as distant in time or as spatially distant and distinct from the museum visitor's and curator's cultural identity.

Distant in time refers to the display of historic and prehistoric human evolution as it is practiced in natural history museums until today, at least the bigger natural history museums worldwide.[12, 13] The other way *the human* has found its way into natural history museums was through ethnographic exhibitions. Meaning, through the display of cultural objects and remains from Indigenous people who were perceived as Other than Western people, primitive and naturalized (Rodriguez, 2020; see section 2.2.).

For now, it is interesting to take a closer look at the role of human remains and anthropological collections in natural history museums in order to better understand how this is different from the way the museums are currently starting to talk about humans in the times of the Anthropocene.

It is to note that not every natural history museum holds anthropological collections or even when doing so many do not necessarily display them in exhibitions. Anyway, this makes it even more remarkable that in the recent years even museums without any distinct anthropological objects or collections noticed the urgency to talk about humans. It raises the questions why this is happening just now, how it is connected to matters of the Anthropocene and if it changes the way museums talk about the nonhuman once human agency is placed "smack in the center of attention" (Latour, 2014a, p.2).

An interesting example to start with is the anthropological department of the Natural History Museum Vienna. It holds two exhibition halls which are showing the exhibition "The Evolution of Man. Becoming (Hu)man" and focuses on the themes of bipedalism and brain evolution. As its curator and former head of the anthropological department Maria Teschler recalls, the exhibition has been

[12] See for instance the Natural History Museum London (2020b) or the Natural History Museum Vienna (2020a) which are holding extensive collections of human remains and are focusing on research fields like "human evolution, bioarcheology and evolutionary and modern medicine" (ibid.).

[13] Often collected and associated within a colonial context, these anthropological collections of human remains are subject to heated debates, repatriation claims and in need of decolonialization processes (see for instance Harris, 2015). While this issue cannot be discussed further at this point, it shall not be left unmentioned.

developed in 2013 after the former exhibition was put down due to a controversial public discussion in the 1990s. In the center of the controversy was not only the anthropological department's role in times of National Socialism but especially the question if the displayed categorization of human races along the shape of skulls and similar biological features is still acceptable. Teschler describes the struggle to subsequently develop a narrative that puts the anthropological collection in a new context and her disagreement with the then director who intended to focus on ethology and depict blood groups. She herself rejected the strict biological approach of the former director and emphasizes how biological and cultural evolutionary processes cannot be treated separately. However, Teschler still decided to focus mainly on aspects of human biology and to end the exhibition's timeline in the Neolithic era, which she explains as follows:

> And then I stopped at the Neolithic era because […] as humans became sedentary and due to human's impact on his environment […], everything became different – I would not say it got out of control, but in fact it did, yes. However, this was the moment where the human being simply started to shape the environment for himself.[14]

Teschler therefore decided to end the exhibition exactly at the very roots of the Anthropocene. With humans forming their environment they can no longer be treated as just another species but require attention that goes beyond the traditional field of natural history. Even though including clear references to present day issues - such as the beginning of milk consumption in the Neolithic era which affects the human body still today - Teschler was hesitant to address and choose from the multitude of topics arising with increasing human agency.

The natural history museum in Graz, Austria, assesses the way humanity started to form and impact its environment as a rather unimportant example of geological processes (see figure 2)[15] and, similar to Teschler, ends its evolutionary timeline at a time were humans have not yet significantly shaped their environment. Figure 3 shows the final section of a grand panorama image at the natural history museum in Graz which chronologically illustrates Earth history. Even so it seems that the depicted humans are already using early stages of tools, they are merely presented as just another species.

[14] Translated from German by the author.

[15] Translated from German the relevant third paragraph of the text board reads: "In Styria we are familiar with sediments of former lakes, of swamp forests and rivers, but also cave sediments from the latest period of the geological history. Often, they contain numerous fossils which provide rich information of the living beings back then. The tell about past environmental conditions and the constant change of various ecosystems. Living beings have specific requirements for their environment, but they also change the same. The human, who started in the current geological epoch (Holocene, <10.000 B.C.) to shape his environment, is only one – geological unimportant – example.

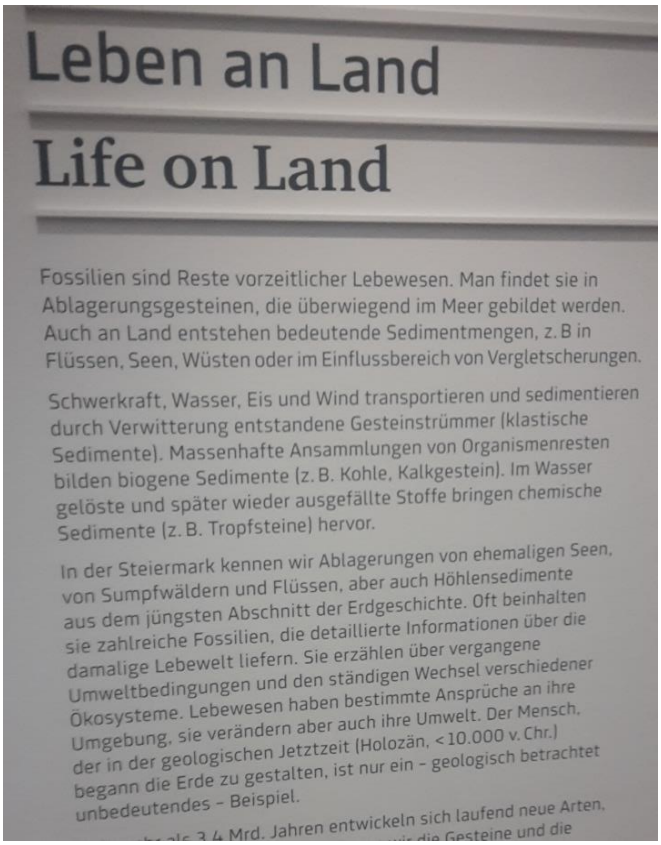

Figure 2: Text board in the permanent exhibition of the Naturkundemuseum Graz, Austria (image taken by the author).

Figure 3: Panorama image illustrating Earth history in the Naturkundemuseum Graz, Austria (image taken by the author).

Nevertheless, among the interviewed museums professionals there is agreement that the narrative of humanity in natural history museums can no longer be reduced to geological or evolutional perspectives. Instead, social and cultural human agency and impact on the nonhuman environment need to be addressed. This means, where earlier traditional displays of human evolution have treated humans as one *natural* species among others to explain evolutionary processes, natural history museums are now starting to de naturalize humans. Talking about humans in the Anthropocene, this

denaturalization means to take into account that the way humanity has irrevocably shaped its environment is not a solely natural process but results from human's social and moral agency.

The conducted interviews reveal that this denaturalization and the consideration of human agency drives museum professionals to review their collections and usual exhibition practices. Thus, the following sections explore how museum professionals perceive and make sense of *human agency* in natural history museums, collections and exhibitions and what this means for human's relationship to nonhumans. Section 5.2.2. analyzes how natural history museums take the Anthropocene as a starting point to look for human traces in their "natural" collections and emphasize interconnectivity in the exhibitions. Subsequently, section 5.2.3. discusses the struggle of museum professionals to acknowledge these human traces without becoming too anthropocentric.

5.2.2. Uncovering Human Traces

The impetus to talk about human agency in natural history museums is closely connected to the urgency of present-day environmental issues. Even before the Anthropocene discourse reached public awareness, it was topics such as climate change and biodiversity loss that caused natural history museums to think about human impact on natural systems.

For instance, Claes Enger - project manager of exhibitions at the Swedish Museum of Natural History - emphasizes that "it was very early to talk about the climate change" when he started to develop the exhibition "Mission: Climate Earth" in 2002. However, the first time the Swedish Museum of Natural History addressed human impact was even more than three decades earlier. In 1966, the low-budget exhibition "Are We Poisoning Nature?" dealt with the impact of mercury emissions on birds and other nonhuman beings, drawing from the museum's own research activity (Bergdahl and Houltz, 2017, pp.221-222). Similarly, the permanent exhibition at the natural history museum in Düsseldorf - which dates back to the 1970s – prominently discusses the pollution of the river Rhine through sewage from industry and cities, a human-caused environmental damage that was widely discussed at that time in Germany (ZDF, 1971).

Considering these early exhibitions on environmental issues as well as the ecomuseum movement (see section 3), it is important to emphasize what then makes the Anthropocene perspective different. As outlined in section 3, one builds up on the other and the rising environmental awareness of the 1960s formed the basis for today's discourse. However, what natural history museums are undergoing under the flag of the Anthropocene is more radical and far reaching. Natural history museum's that are thinking with the Anthropocene perspective are not limiting their approaches to single exhibitions or temporary displays of urgent environmental issues. Instead, they are striving for a more thorough and holistic understanding and representation of these issues and subsequently of all living and

nonliving beings on Earth. This becomes evident when Nicole Heller reflects on the usage of the new term:

> [D]o we need to use the term Anthropocene with the general public? Is it a good term to use? Is it confusing? You know, I generally think it's useful because it sort of provokes curiosity. And I think that it forces us to think very broadly about the changes that are happening and how they're all interconnected with each other. And so, rather than just focusing on climate change, you know, it forces you to think more holistically about what's happening when the earth system changes.

The consequences of this advancement of interconnectivity and holistic thinking are multiple. When *talking about humans,* one effect of these notions is that museum directors and curators started to realize that there are so much more human traces to be found in their collections and exhibitions than one might have assumed. Meaning, indicators of human influence go beyond dedicated anthropological collections or climate change exhibitions. The Natural History Museum London, for instance, is currently reviewing all their collections to search for imprints and stories of human impact among objects. Camilla Tham describes how this new perspective on the collections has brought interesting insights:

> [W]ith our bird's collection we have a whole collection of lots and lots of nests as well. And in that collection our curators have found a few nests that have bits of plastic and metal wire actually woven into the nests. So, this is actually a really beautiful example of a specimen that's naturally formed in a natural way, but has incorporated manmade material. And is kind of one example of human impact. And so, what we're currently doing is trying to go through the collections and identify specimens that are a bit like that. That very clearly reflect human impact.

Tham goes on to illustrate how the data of their insect collection tells stories about global warming and its connection to biodiversity loss. Or how specimens of the same fish, collected over time, reveal insights on the overfishing and exploitation of the ocean through the noticeable reduction of its size.

These examples show how collections that were previously perceived as nonhuman or *natural* – as distinct to human - are now assessed in a whole new light. Curators start to realize that they have already access to more stories about human-nonhuman interconnectivity than they might have thought. Building on this realization, the museum professionals strive to include this insight into their displays and exhibitions and pass the message on to their visitors. Currently, curators are thinking about how this message could be conveyed adequately. Next to conventional temporary exhibitions,

the Natural History Museum of London is, for instance, considering the possibility of pop-up interventions throughout the different gallery spaces.

This idea derives from the understanding that in order to truly follow the notion of interconnectivity on the long term, it is necessary to also rework permanent exhibition spaces. However, this process is still in the early stages. The reflections of museum professionals on the current presence of human influence in permanent exhibitions are nearly exchangeable. Anni Granroth from the Finnish Museum of Natural History states that humans play "[n]ot a role at all, almost". Claes Enger from the Swedish Museum of Natural History similarly admits that besides the climate exhibition "a lot of the exhibitions is just about nature without humans". The same applies to Linda Gallé from the natural history museum in Berlin: "In the current permanent exhibitions, there are hardly any references to the human role."[16]

Even the Natural History Museum London, so one of the few that has explicitly dedicated resources to Anthropocene issues, is still in the brainstorming phase as Camilla Tham reflects during the interview:

> [T]here are plans in the upcoming years to change some of the public spaces in the museum. At the moment, if you look at our permanent galleries, they're arranged almost quite taxonomically. […] Which is fine, and people like that, and that's cool. But what we perhaps maybe don't do enough of is really that storytelling and the biodiversity narrative that you could weave through some of those galleries. It's not quite there. So, […] we'll be looking to address things like that, to do more storytelling, to highlight narratives and interconnectivity throughout the natural world.

Thus, on the long run the museum aims to, at least, modify the traditional modes of display along taxidermy or natural habitats and start weaving the notions of interconnectivity throughout all halls and displays of the museum. Therefore, where human agency was previously addressed in dedicated gallery halls or temporary exhibitions - mainly referring to destruction and urgent environmental issues - this new understanding opens up to more holistic and less unidirectional representations of the human-nonhuman relationship throughout the whole museum.

It is to note that only few museums have the possibilities and resources to change the permanent spaces right away and truly implement the narrative of interconnectivity into their exhibitions. Instead, Anni Granroth describes how the process of extending the messaging from a single exhibition to the whole museum, turns out to be a slow and costly one

[16] Translated from German by the author.

> We have a lot of will, to do that. We are not going to build that exhibitions over again. It's a huge work and cost a lot of money. But we are trying to make small changes there all the time, where we highlight these problems.

This is a difficulty she shares with many of her colleagues from other natural history museums who emphasize the resulting gap between their reflective curatorial ideas and the and the actual implementation. A difficulty of greater conceptual relevance for this research, however, is that the recognition of human agency in natural history museums' collections and exhibitions is not only an important facet of the Anthropocene discourse, but does at the same time constitutes risk fall for the other extreme and become too anthropocentric. The struggle of museum professionals to balance these two notions, is presented in the following section.

5.2.3. ANTHROPOCENTRISM

It is clear by now, that natural history museums are striving for the disclosure of human impact within their collections and aim to make it visible in their temporary exhibitions as well in permanent gallery halls. However, this acknowledgment of human impact is only one aspect of what the Anthropocene perspective calls for. Based on the discourse of the ontological turn, as outlined in section 2.2., a more thorough level of the Anthropocene perspective highlights the importance of sincere recognition and dignity for other modes of existence (Kohn, 2015, p.321). This refers not only to fostering equality in conceptional terms, but also to value nonhuman beings as actors who participate in this interconnected world with their own perspective and personhood (Kohn, 2013, 2015; Tsing, 2015).

Many of the respondents indicated the difficulty to overcome an unidirectional perspective. Linda Gallé's reflection on the Anthropocene gives an indication of what might be one of the greatest challenges in this regard:

> Buzzword Anthropocene, so the epoch of humans. What impact do human beings have on nature – and maybe to go even a step further from there. Not, what impact do we have on nature. Because we are a part of nature. But to overcome the understanding that the human is somewhere above. Instead, that we are part of it.[17]

Thus, what Gallé identifies as the core messages of the Anthropocene, is to address human agency on the one hand and break up the hierarchy between human and nonhuman beings on the other hand. That it is challenging to bring those two aspects together, is made even more explicit by Camilla Tham:

[17] Translated from German by the author.

> I think it is really important to reconnect humans with natural systems to understand things like ecosystem services and to understand where our food comes from and where our air comes from. Our oxygen, sorry. All that stuff. But that does feel very … that is very anthropocentric. That is very much how can we use nature to keep us alive. Which of course we do, but it's not just about that.

What Gallé, Tham and many of their colleagues at other natural history museums are struggling with, is to keep the balance between raising attention for the extensive and destructive agency of humans at the one hand, and to prevent and diminish too human centered approaches on the other hand. This reflects one of the major challenges of the Anthropocene discourse in general, as it was outlined earlier in section 2. Through its focus on human agency, the discourse runs risk to convey a message quite contrary to its intentions. Namely, to produce a rather *human* perspective on *human* impact on an environment which is to safeguard for *us humans* (see Haraway, 2015).

On first sight, it might seem that it is an even greater challenge for museums to bridge these two poles of talking about human agency but not becoming too anthropocentric. Because, as Hub Kockelkorn - project manager at The Museon in The Hague - distinctively points out, museums are innately *for people:*

> [I]f we're talking about animals it should be in relation to people. If you're talking about minerals, it should be in relationship to people. So, it's always about the interconnection between environment and people. The earth and people. […] People are the starting point […].

This postulation clearly reflects the image and mission of most present-day museums. As highlighted in section 3, natural history museums have shifted from quite exclusive and collection-centered institutions to more open and visitor-orientated spaces which puts the relatability of the collections for people right in the center of attention (Bergdahl & Houltz, 2017, p.219; Harrison, 1993, p.167; Miles, 2007, p.129-130). However, the initial starting point of natural history museums has not been *people,* but *nature* (Koster, Dorfman & Nyambe, 2018, p.30). Moreover, as stated in section 5.1., museum professionals are confident that natural history museums hold an important and favorable position to (re)connect both sides of the perceived dualism.

The human side and the way natural history museums have started to identify the need to consider the social, cultural and political agency of humans have been illustrated in this section. Therefore, the next section (5.3.) will now take a closer look at the Other side of this relationship and analyze how museum professionals reflect on nonhuman beings, their agency and their personhood.

5.3. Animals – And Other Nonhuman Beings

In the permanent gallery halls of the Natural History Museum Vienna one finds a multitude of different nonhuman beings exhibited over two floors. The visitor first enters the halls of minerals, stones and meteorites, then proceeds to the "history of earth" section and the fossils. Next are the dinosaurs followed by prehistoric objects and the earlier mentioned halls of anthropology. Last of the 16 halls in the mezzanine level is the planetarium. The first floor then is about animals and shows twelve halls of protozoans, corals, mollusks, crabs, arachnids, insects, fishes, amphibians, reptiles, birds and finally seven rooms with mammals (Natural History Museum Vienna, 2020b). This impression of one of the world's biggest natural history museums does not only show the great heterogeneity and diversity of natural history collections but is also representative for their great emphasis on zoology or, so to say, the animal kingdom.

This might not come by surprise, as Wolfgang Paill - chief curator of the zoological department at the natural history museum in Graz - points out. He states that due to the great diversity of animal life, most natural history museums have far more zoological staff than, for instance, mineralogists. Even when moving beyond the numerical dominance of animals in natural history collections, there is a noticeable difference in how animals and how other nonhuman beings are approached. More precisely, animals are more often ascribed some form of personhood than other nonhuman beings and their relationship and relatedness to humans is addressed more explicitly.

Therefore, the following section 5.3.1. will explore the perspectives on animals and their relationships to humans as they are implement in natural history museums' exhibitions and collections. Subsequently, section 5.3.2. will illustrate how museum professionals reflect on the moral struggles associated with the display of animals. The potential of animal and other nonhuman displays to foster care and respect for the nonhuman world is addressed in section 5.3.3.. Finally, section 5.3.4. analyzes museum professionals' reflections on - and concrete examples of - natural history museums' potential to foster perspectives other than the human one.

5.3.1. The Human Animal

The exhibition "The Human Animal" at the Swedish Museum of Natural History is dedicated to the presentation of the relatedness of humans and other animals. It compares and explores the similarities and differences in bodily features of humans and, for instance, apes, giraffes, pigs, horses and worms. "Why do we lack fur and why do we have long legs?" is one of many questions the visitor will find answers to, as it is promoted on the museum's website (Swedish Natural History Museum, 2019). According to the assessment of Claes Enger, "The Human Animal" is, next to the museum's climate

change exhibition, the only other exhibition that is talking about humans. “A lot of the other exhibitions is just about nature without humans”, he reflects.

What is noteworthy about the exhibition’s perspective, is that the exploration of what connects and what distinguishes humans from animals - and the other way around - is reduced to evolutionary aspects and physicality (ibid.). The museum’s approach is therefore what Descola calls the naturalist ontology (Descola, 2013b, pp.259-301), as it was explained in section 2.2.. Therewith, what is perceived as comparable are the bodily features and specific physically abilities that have evolved over time. Yet, there is no mentioning of interior characteristics that humans and animals might have in common. Just as it was illustrated for the case of humans in section 5.2.1., animals are naturalized by talking about physicality without considering personhood, agency or even emotion.

While the insights by the interviewed museum professionals are indicating that this perspective is representative for great parts of animal display in natural history museums, there are also examples where curators and directors reflect differently on the interrelation and relatedness of animals and humans differently.

Most of these instances refer in some way to humanity’s destructive impact on the nonhuman world, as illustrated also in section 5.2.2.. In relation to animals, these considerations are accompanied by ethical and moral reflections on topics like meat consumption, extinction and habitat loss. Linda Gallé, for instance, mentions that habitat loss and threat of human-caused extinction were major topics in an exhibition about macaws at the natural history museum in Berlin. She describes:

> Much of the soy is cultivated because we as Western countries, for instance Europe, need that soy to feed it to our animals for fattening. Meaning, great parts of these areas [of macaw habitat] are only cultivated and deforested so that we can have our steak on a grill during summertime.

Gallè’s example of human impact has strong normative notions of “us” as humans being accountable and even culpable for the habitat loss and death of other living beings. This tendency, to leave traditional natural history display and to address humankind’s relationship to animals on a more ethical level, is strongly present in an exhibition on animal sculptures at the natural history museum in Düsseldorf. The exhibition itself is quite an unusual one for a natural history museum, as it focuses on life on work of the German animal sculptor Josef Pallenberg. Around fifty years after Pallenberg’s death in 1946, the German animal sculptor’s artistic legacy was partly transferred to the local natural history museum. Director Stefan Schweizer admits that the museum was aware right from the beginning that it would be a challenge to define the collection’s position within the context of a natural history museum. Nevertheless, he was sure that the value of the Pallenberg collection exceeded the artistic

dimension and would equally satisfy the expectations of zoological interested visitors. He highlights the zoological and anatomical accuracy of the animal sculptures and states:

> Pallenberg never perceived himself as an artist but more as someone like a taxidermist. He wanted to produce scientifically accurate zoological demonstration material […]. We treat the collection as oriented towards natural science. With the means of art. And we try to put the artistic aspect aside. So that the collection fits into the natural history museum.[18]

Even though the museum was eager to focus on the natural scientific value of the collection, the special context and nature of the collection and its genesis draw the curatorial team to address more than the naturalist aspects of the sculptures. Schweizer narrates that Pallenberg was sharing his home with the animals which he depicted, including large cats like tigers. He emphasizes that even though he assesses Pallenberg's relationship to animals as emancipatory for his time, there are still some notions that need to be critically reviewed:

> The collection holds an ethical problem as well. Namely, the illusion one could one-to-one live with animals. One could use them as material. Basically, use them as a resource. […] We cannot leave that out [of our considerations]. In the end, the domestication of animals is always an act of violence. And in the end, he made his living from this act of violence.[19]

These reflections - and therefore the relationship of animals and humans - have become one of the major themes of the exhibition. Contrarily to the earlier mentioned exhibition at the Swedish Museum of Natural History, the Pallenberg exhibition approaches the relatedness of humans and animals from a less naturalist perspective. Therewith, it opens up to comparisons of human and nonhuman beings in terms of experiences and feelings instead of solely bodily features. The final section of the exhibition slightly leaves the context of the Pallenberg collection itself and expands to more general issues such as meat consumption and animal rights. Even more, by referring to scholars such as philosophers Jeremy Bentham and Jacques Derrida or anthropologist Donna Haraway, it explores the conceptual frameworks to treat man and animal equally and acknowledge the comparability of emotional and social facets of humans and animals. Herewith, the exhibition explicitly draws from the theoretical discussions on human-nonhuman relationships as they are also outlined in chapter 2. Schweizer himself emphasizes how compassion for animal suffering is important to foster "Gleichrangigkeit" [English: equality of status]:

[18] Translated from German by the author.
[19] Translated from German by the author.

> One only needs to project human suffering on animals. What should not be too hard, intellectually. [A]nd we know that from animals who are experiencing loss. Who lose their own children, their own parents. But who also lose their human companion, their partner. We know how animals are suffering. Period. And this has to be a call to get into dialogue with animals differently and to take the animal seriously as a dialogue partner. That means, even if they are not expressing their suffering verbally, I nevertheless have to take it as seriously as suffering that is expressed verbally.[20]

To summarize, the approaches at natural history museums to talk about the relationships and relatedness of animals and humans range from evolutional or naturalist perspectives as in "The Human Animal" to reflections on social and emotional similarities of humans and animals and the call for acknowledgment of animals as dialogical partners.

The following section 5.3.2. will now explore how the perspective on animals as beings with equal qualities and personhood as humans poses ethical and moral challenges for natural history displays, when taken seriously.

5.3.2. Displaying Dead Creatures

In section 5.3.1., it was illustrated how Schweizer identified an ethical problem in the genesis of Pallenberg's animal sculptures and the implications that animals could be used as resource. For the Pallenberg collection, "resource" refers to the fact that living animals served as a template for the artist's sculptures. Schweizer calls this and the preceding domestication of animals an act of violence.

Traditional natural history collections are subject to even greater ethical difficulties as they do not display artistic realizations of animals but actual animals, more precisely their dead bodies. Not only Schweizer, but also Gallé and Heller addressed how this fact raises challenging questions for natural history museums which, in most cases, have not yet been faced and discussed. Recalling her own irritation when she started working at the Natural History Museum London, after being a field biologist, Nicole Heller reflects:

> [T]here's a lot of dead creatures. And I think it's interesting to think about: how does the public perceive all of that death? And how does that align with stories of sustainability and conservation. How is it kind of a disconnect for people if the museum is sort of like, "Oh, we're all about conservation and sustainability and the value of these creatures - and here's

[20] Translated form German by the author.

> all these dead bodies on the display". And drawer full of drawer full of drawer full . . . you know, a lot of creatures have been killed.

The contradiction of emphasizing the value of nonhuman creatures on the one hand and displaying dead animals on the other, is similarly addressed by Linda Gallé. Like Heller, she expresses the impression that natural history museums have the obligation to explain this imbalance to their visitors and the public. Gallé describes how especially exhibitions that address human-caused extinction trigger irritation among visitors:

> Many are asking: "Huh, how do you get these animals? You are doing this exhibition and you say all of them are so threatened with extinction – but you have dozens of them in your vitrines. Where do they come from?".[21]

In response to these questions, Gallé highlights that in present days most animals are not killed to be displayed in natural history museum but died a natural death, mostly in zoos. While this provides context and defuses the underlying accuse that natural history museums might have contributed to the extinction of the displayed animals, it does not solve the ethical problem of displaying dead creatures. To illustrate this fact, Heller draws the comparison to the display of human remains which, as she notes, has been subject to many ethical discussions. She wonders why "we don't think it's appropriate to show human bodies anymore" but have not yet reflected on the ethics of displaying nonhuman remains. Consequently, Heller is eager to find different ways to go about the display of nonhuman remains and to contextualize the death of displayed animals in natural history museums' exhibitions.

For Schweizer, it is one of the strengths of the animal sculptures collection that this ethical dilemma of how to deal with nonhuman remains is circumvented. When comparing the Pallenberg collection with the museum's ornithological collection, Schweizer concludes:

> One of the advantages is, of course, that you do not need to make use of animal material when you work sculpturally. While the taxidermist relies on the cadaver. And the cadavers are not coming out of nowhere, but they are the result of murder.

Even though the case of the Pallenberg collection is a very specific one and not representative for the majority of natural history museums, it does indicate that artistic objects and installations offer a way to talk about the nonhuman world without the need to display dead creatures. That this does not mean to abandon the scientific premise of natural history museums is not only demonstrated by Schweizer's

[21] Translated from German by the author.

assessment of the Pallenberg collection but also by, quite different, examples at other natural history museums.

That human-nonhuman relationships can be addressed with the means of art and without displaying nonhumans themselves becomes visible, for instance, in the temporary exhibition "Artefacts", which was displayed in 2019 at the natural history museum Berlin. As curator Linda Gallé explains, the title of the exhibition already reveals not only the exhibition's topic but also its curatorial approach. In terms of content, "Artefacts" refers to "something humans have left behind" and hints at the exhibition mission to make humanity's impact on the environment visible. The second meaning of the title is that the exhibition's concept aimed to bridge "art" and "facts" and was based on a collaboration of the Joint Research Centre of the European Commission, scientists of the museum itself and the photographer Henry Fair. The exhibition itself was designed in equivalence to stereotypical art exhibitions. Fair's photographs were presented on white walls without further information, showing aerial views on various landscapes that are abstract, "highly aesthetic and beautiful", as Gallé attests. Only when stepping behind the walls, the visitors learned what exactly the photographs are showing:

> For instance, there was this picture that was completely pink. And that was colored urine of pigs coming from intensive animal farming. There was a hurricane, I think it was in the USA […] and the faeces were spread all over an acre.[22]

Complementary to the photograph's context the visitor was then provided with information and impulses to a related topic. In the stated example, this was meat consumption. Following this structure, the exhibition covered a multitude of topics related to human impact and possible solutions to overcome the destructive nature of human agency.

Both, the Pallenberg collection in Düsseldorf and the "Artefacts" exhibition, used art as a medium to talk about humankind's agency towards and impact on the nonhuman world without the need to use dead and objectified nonhuman in their displays. Camilla Tham equally emphasizes the value of artistic encounters to talk about these subjects in a different way. When prompted to reflect on the question if art is hereby a medium of usual science communication or if this value refers specifically to Anthropocene topics, Tham responds:

> [W]hen you want to raise people's awareness of our interconnectivity with the earth system, that's quite hard to do through just the collections and through our scientists. It's possible, but if you think about working with an artist, he could do something [to make you] feel a bit more immersed in that kind of system. […] So yeah, it's about science communication, but

[22] Translated from German by the author.

> it's also about connecting with people in a more, I don't want to say emotional, but in a different level.

To return to the display of dead creatures, this assessment of artistic encounters indicates that art has also the potential to address people's emotions that they might feel when they gaze at death creatures in natural history museums.

The natural history museum in Rotterdam, however, decided not only to display dead animals but to make the contextualization and circumstances of animals' deaths the central theme of their exhibition "Dead Animals Tales". According to curator Bram Langeveld, "Dead Animal Tales" exhibits "animals that died in a peculiar way, usually by involvement of humans". Ranging from a hedgehog who died with a paper cup on his head or an aquarium fish that was swallowed by a teenager, the exhibition tells stories of how human agency has led to the death of animals. Asked about the underlying message of the exhibition, Langeveld admits:

> [W]e don't want to just entertain and I personally also don't want to just entertain. But some of these [stories] are simply just entertaining to some people. Or at least fascinating. […] They like the idea . . . of course, not of an animal perishing, but they do like the idea of unusual or weird stories behind, uh, the objects. And we really do capture their fascination […].

This statement reveals the polarity of displaying dead creatures. One the one hand, the idea of animals dying is an uncomfortable one for both, curators and visitors, and a conscious reflection of it reveals the related moral and ethical difficulties. On the other hand, there seems to be something fascinating about it. Interesting is hereby, that Langeveld chose to use the word "animals" when talking about them perishing – but switched to the word "objects" to describe how people enjoy the exhibited stories of animals' deaths. Therewith, he mirrors the divergent nature of the way natural history museums are dealing with living beings but objectify them for their exhibitions and to tell "curious stories", as it was outlined in this section.

However, the display of - dead - animals and other nonhuman beings in natural history museums is not solely or inevitably contradictory to the museums' missions and curators' goals to convey the value of nonhuman beings. The following section (5.3.3.) will illustrate how it is exactly the fascination, that Langeveld noticed among the visitors, which holds the potential to create sincere care and respect for the nonhuman world.

5.3.3. Fostering Care for the Nonhuman World

The previous section has illustrated how the display of nonhuman beings in natural history museums is subject to moral and ethical challenges. The cited museum professionals have perceived the display of dead animals as contradictory to the museums' mission to convey the value of nonhuman beings. However, this research has found that despite the ethical problems, curators perceive this encounter of visitors with nonhuman beings - even if dead - as essential to foster an understanding of equity and mutual respect. More precisely, it holds the potential to stimulate care and fascination with the nonhuman world among visitors and to foster other dimensions of human-nonhuman relationships than the destructive force of humankind towards the nonhuman world.

For instance, Camilla Tham illustrates how fascination amongst visitors for impressive specimens at the museum is fostering attachment to the nonhuman world that goes beyond notions of interdependency:

> That 'wow' isn't about what can that dinosaur do for my food? Like, the dinosaurs can't do anything. We're just amazed by them because we're inspired by them and they're fascinating. So, that point of fascination and inspiration is something that's really key to get people to love … I mean, yeah, I feel weird using the word love … but actually, I don't know.

Tham's irritation to use the word love reflects a struggle that other museum professionals have expressed similarly. Granroth, for instance, states that in their climate change exhibition the curators tried to make use of the visitor's feelings to bring across the message "even though it's science that we are representing there". This is interesting, as it indicates a couple of noteworthy findings.

Firstly, when people are visiting natural history museums, "nature" and the displayed nonhuman environment provoke emotions and museum professionals are aware of that. They are also recognizing the potential to connect people more closely to the exhibition's message through emotional attachment – yet they are not sure how this relates to their scientific based mission. On the one hand, emotion is "key" to reconnect humans to their nonhuman environment and overcome the disconnection that has caused the Anthropocene, on the other hand it "feels weird" to talk about emotions or love as an institution which characterizes itself as a research institutions that is based on factual natural science.

The provoked feelings are mostly positive ones such as fascination and awe towards life on Earth. In contrast, "this Anthropocene thing [and] all those unsustainable things we have been doing", as Anni Granroth puts it, is fostering merely negative emotions through its focus on destruction and challenging environmental issues. This means, when natural history museums start to talk about Anthropocene topics, they are suddenly confronted with the challenge to convey controversial and

upsetting topics in their exhibitions where they had previously focused on the beauty, diversity and fascination of Earth.

Thus, the negative emotions associated with environmental issues and human destruction simultaneously encourage natural history museums to emphasize, next to their scientific expertise, the positive emotions people are feeling towards many of the nonhuman beings which are displayed at natural history museums. The Finnish Museum of Natural History, for instance, chose not to finish their climate change exhibition with a video screen showing the impact of human destruction. Instead, as Granroth describes, they added a last room which is designed to look like a forest and shows possible solutions for the environmental challenges. She states: “It doesn't feel good. It feels like you want to go out from the room. And the place you escape is a beautiful forest”.

Equally, most of the interviewed museum professionals expressed their efforts to balance between information, feelings of fascination and negative emotions when it comes to topics of the Anthropocene. The curator of the natural history museum in Rotterdam, Bram Langeveld, mentions how to achieve the museum’s mission to foster care and respect for the “natural world” it is necessary to give visitors a positive experience. Camilla Tham emphasizes that “we want people to be aware of human impacts on these natural systems, but we don't want to depress them or turn them off” and Claes Enger states that he wants to address those issues “rather positive”. Likewise, Gallé describes how topics of human impact and destruction always need some form of positive counterpart in an exhibition:

> Of course, the whole problem is hard to grasp, it’s complex, it’s depressing […]. And that is why we decided to do the macaw exhibition […], it builds an interesting counterpart. We have these stunning birds with these vivid colors and that is something beautiful. There must be some funny and nice elements as well in the exhibition.[23]

Gallé, as well as the previously stated examples, is hereby setting human impact and destruction against the beauty of the nonhuman world. Nicole Heller, on the other side, is taking a different standpoint in this regard. She argues, that to create a positive future it is inevitably that *we as humans* are “rethinking our relationship to other living beings”. According to Heller, the dualism of humans and nonhumans cannot be overcome when people – and natural history museums – are focusing solely on the negative agency of humans when it comes to human-nonhuman relationships. She states:

> I'm really interested in thinking a lot more about [rethinking our relationship to other living beings] and telling the stories at the natural history museum about the positive relationships

[23] Translated from German by the author.

> between people and other living beings. I think that we've been too focused on a story that is always pitting humans as a kind of negative entity.

Interestingly, these positive relationships of people and nonhuman beings are already present at natural history museums but are often not recognized as such by the museum professionals. This becomes most visible when looking at examples of individual animals that have gained local or international prominence and are displayed at natural history museums.

One example is the elephant Ramon who lived in the zoo of Rotterdam and died at the end of the 20th century. After his death, his remains were transferred to the local natural history museum. Curator Bram Langeveld describes how people have developed emotional attachment to Ramon during his lifetime - which lasted beyond his death:

> And then people really miss [elephant Ramon] because a lot of people visit this Rotterdam zoo, and they really like it. So, they miss their famous elephant. We got the skeleton […]. And we put it in [the museum] and then people can come over and visit Ramon again. And then with that, of course, we teach about the life of the animal, show for example its teeth and its tusks. It had them removed because they were infected. So, it's an impressive skeleton.

In line with the findings of section 5.3.1., the museum decided to focus on bodily features in its displays, despite Ramon's prominence and people's sympathy with the elephant within his lifetime. When asked during the interview if the museum has in some way addressed the emotional side of Ramon's life and his relationship to the people, Langeveld stated that "the short answer is no". Even though mentioning in the exhibition that Ramon was famous, the museum "did not delve into any details with that". Interestingly, Langeveld adds that he believes the museum would approach this quite differently today than fifteen years ago. He explains:

> [N]ow we try to get more involved with our audience. To get more people more involved with us. And this is something that is clearly a goal and opportunity if you would have it now.

Ramon's afterlife in the natural history museum has been perceived as a chance for people to continue seeing him. Quite different was the situation with another well-known animal that found its final destination in a natural history museum.

The polar bear Knut, who was "one of the word's famous polar bears" (Davis, 2019, p.111), died in Berlin's zoo in 2011 and, just as with Ramon, his bodily remains were routinely transferred to the local natural history museum. Reflecting on the display of dead animals' bodies, as reported in section 5.3.2., Linda Gallé recalls how the death of Knut and his transfer to the museum provoked a completely different scenario than with any other specimen before.

> There is a difference when you have such highly emotionally charged animals like Knut […]. He has come to our museum just as any other animal of the zoo. But it provoked wild storms of indignation among the local press and the local population. That the natural history museum would now take this polar bear's fur. That this would not be justifiable from a moral and ethical perspective. In this case, Knut has become a person [German: Persönlichkeit][24]. It was not an animal anymore, no object in this sense. But it was perceived as a person. Accordingly, it provoked very, very emotional reactions back then.[25]

In the case of Knut, people's positive emotions towards the animal, in life, have resulted in a lack of understanding for the usual practice of transferring the animal's fur to the museum after his death. As Gallé emphasizes, Knut was ascribed personhood and therefore the public felt that he needed to be treated just as a human being. Gallé rightfully claims that it is likely that the some of the people who where demonstrating for Knut to be buried next to his zookeeper with a personal gravestone, are at the same time "buying their steak from intensive animal farming where an animal is just meat on four legs".

Nevertheless, the strong de-objectification of Knut that has taken place, demonstrates that when people are emotional attached to another *being*, human or nonhuman, they perceive them as persons and call to treat them as such. Equivalent to Viveiros de Castro's (1998) perspectivism, as introduced in section 2.2., the acknowledgment or ascription of personhood to a nonhuman being has significant consequences for the way nonhuman beings are perceived and treated.

To summarize, museum professionals have identified the need to foster positive emotions amongst visitors towards the nonhuman world in order to balance the depressing message of Anthropocene topics. Mostly, these positive emotions are stimulated through emphasis on the beauty of "nature", such as colorful birds or peaceful forests. However, there are also voices that call to overcome this dualism of destructive humans on the one side, and delightful "nature" on the other side. Accordingly, natural history museums should stress the positive side of human-nonhuman relationships to create a positive future. The examples of prominent animals at natural history museums have illustrated that natural history museums not only in hold of potential stories to foster these positive emotions but also that these stories show how emotional attachment corresponds with a more ethical and equal perception of nonhumans.

[24] To be a „Persönlichkeit" can be translated as "having character" or "having a personality".
[25] Translated from German by the author.

5.3.4. Embracing Nonhuman Perspectives

Stimulating fascination and positive emotions for nonhuman beings in natural history museums is an important step in order to promote a less hierarchical relationship between humans and nonhumans. However, recalling the theoretical discussion of the ontological turn in section 2.2. and section 5.2.3., it is to note that this perspective is still an anthropocentric one, directed from humans towards nonhumans. Bram Langeveld, curator at the natural history museum in Rotterdam, responds to the question how he perceives the human role in the museum's exhibitions:

> I think the role of the humans is basically the same in all the exhibitions because, to be quite frank, we do not really have any exhibition that looks at the subject from an animal perspective, from a nonhuman perspective. In all exhibitions we really look from a human perspective, whether that's 'urban nature' or these 'dead animal's tales' or our fossil exhibition. We always look from a human perspective to nature.

With this, Langeveld hints at what the Ontological Turn calls for. Namely, to nurture nonhuman perspectives next to the human ones and start considering the self-reflective personhood of nonhuman beings (Kohn, 2013; Tsing, 2015). Langeveld recalls that he has visited a regional museum in the North of the Netherlands, Natuurmuseum Friesland, where this change in perspective is integrated to some degree. There, visitors are invited to symbolically dive under water - in a local ditch – and to look at fish, birds and other inhabitants from "the perspective of a frog". Reflecting on his visit and expressing his fascination for this change in perspective, Langeveld concludes:

> I had the idea that I was paying more attention to what I was reading than I normally would. Which is already a lot. Because of this change in perspective. I think it got better with me. The message got better.

Thus, additionally to the conceptional value of fostering a more equal understanding of human-nonhuman relationships, the change in perspective also holds some potential to engage visitors in a new and immersive way.

An exhibition that actively promotes the nonhuman perspective, is the travelling exhibition "The Earth's Thin Skin: Our Soil". Designed by the Museum Görlitz (Senckenberg, Germany), the exhibition is currently displayed at the natural history museum in Graz and was analyzed together with the museum's permanent exhibition by the author of this paper. Talking about soil as a habitat, three out of four sections are designated to either the relevance of soil for human life or human destruction of soil.

Figure 4: Illustration of two insects in conversation. In the exhibition „The Earth's Thin Skin: Our Soil" (image taken by the author).

Figure 5: Illustration "Maulende Milbe" in the exhibition „The Earth's Thin Skin: Our Soil" (image taken by the author).

Throughout the exhibition, one can find small illustrated insects who are guiding especially children through the soil by drawing on similarities to human experiences. Thus, even though using humanized words, phrases and explanations, the exhibition is presenting insects as *beings* in their own rights who have agency and maintain relations with each other (see figure 4 and 5)[26, 27].

Additionally, the exhibition is offering an embodied experience as an insect by making use of virtual reality technology. Virtual reality glasses take the visitor on a journey into the soil from a woodlouse's perspective and therefore give "insights into a world that is normally hidden from the human eye"

[26] Translated from German, on the left side: "Soil is a great home indeed, don't you think? Many of my friends, relatives and acquaintances live here."
On the right side: "Sure! Soil is a true all-rounder. It helps to balance heat and cold. Through life in soil many substances are degraded which can then built mineral nutrients that are needed by plants. Small soil particles can hold back harmful substances. Without soil there would be no life on Earth.

[27] Translated from German the speech bubble says: "The ground is too hard; the pores are too small – I simply do not fit here". The insect is underwritten with the words: "Grumpy mite".

(Joanneum, 2020). This approach conveys a strong implication that humans are able to see soil in the same way a woodlouse does - once bodily differences are overcome. Therewith, the offered experience goes to the very heart of Viveiros de Castro's perspectivism as well as Descola's definition of animistic ontologies (Descola, 2005, 2013; Viveiros de Castro, 1998). As outlined in section 2.2., Viveiros de Castro argues that in Amerindian perspectivism human and nonhuman beings are ascribed the same self-reflective personhood. Therefore, different perspectives on the world are based on bodily differences while the ability to *see* and perceive the world is the same among all living beings (Viveiros de Castro, 1998). Closely connected are animistic ontologies where humans and nonhumans are believed to share a similar interiority or personhood and differ only in their embodiment (Descola, 2013b, p.197). Now, the exhibition is conveying the perception that by putting on virtual reality glasses and recreating the bodily experience of a woodlouse, visitors gain an understanding of a woodlouse's perspective on soil. Therewith, it indicates that what makes a woodlouse's perspective on soil different from the human one is not a distinct perception of the world but its embodiment.

Figure 6: Display of butterflies at the Naturkundemuseum Graz (image taken by the author).

The significance of "talking" insects and the possibility to experience an embodied nonhuman perspective becomes evident especially when viewed in contrast to the museum's permanent exhibition. There, plants, animals and minerals are lined up in order, silently, in strict taxonomic classifications to be watched at by humans and not to have agency themselves, talk, or even express how they perceive their environment (see figure 6).

As mentioned by director Wolfgang Paill, there was another temporary exhibition at the natural history museum in Graz that also tried to incorporate a nonhuman perspective. In the context of natural conservation one exhibition room was dedicated to the perspective of a toad:

> In the second room we have put ourselves in the position of a toad which is on its way to its spawning waters. Where a car is crossing almost right next to it.[28]

Noteworthy, Paill describes the setup of this exhibition room as inspired by fairytales and fables. He therefore indicates that what appears as a profound change in perspective on first sight, might rather be a welcome variation in modes of display to spice up the exhibition. Nevertheless, even if the

[28] Translated from German by the author.

curatorial intentions and the degree of reflection are not clear, the illustrated examples still indicate a way of how nonhuman perspectives can be included in natural history exhibitions.

So far, this master thesis has discussed the implications and consequences of the Anthropocene discourse for the implementation of human agency in natural history museums on the one hand (section 5.2.), and the display and treatment of nonhuman beings on the other hand (5.3.). In numerous instances the findings were connected to the theoretical discussion (chapter 2) of the Anthropocene and human-nonhuman relationships. However, one important notion of the theoretical framework has not been addressed yet. Namely, the acknowledgment that many of the theoretical considerations - and subsequently the reflections of the interviewed museum professionals – are based on Indigenous ontologies and Indigenous thinkers. Therefore, section 5.4. follows the question to which extent natural history museum professionals are aware of this connection of the Anthropocene discourse and Indigenous thought and how they assess the value of Indigenous knowledge for their museum practice.

5.4. Acknowledging Indigenous Knowledge

And part of that is about recognizing […] the wisdom, the knowledge, the alternative ways that Indigenous people in different places have related to the natural world. And continue to relate to the natural world. And those stories, those practices are a really powerful source of knowledge that I think we all need to learn from in this time of rethinking our practices for sustainability.

Nicole Heller
(Interview)

Wisdom, knowledge, and alternative ways to relate to the natural world. The opening quote by Nicole Heller summarizes the value and importance of Indigenous knowledge for the re-thinking of human-nonhuman relationships and "practices for sustainability", as it was also outlined in the theoretical discussion in section 2.2.. Moreover, it expresses the high degree of reflection on these issues by Nicole Heller, indicating that the Curator of Anthropocene Studies is aware of the connection of the Anthropocene discourse and Indigenous knowledge.

However, the majority of the interviewed museum professionals - as well as the field of natural history museums and academia more general (see chapter 2 and 3) – have not fully recognized the explanatory power and value of non-Western knowledge. Therefore, the main focus of this section lies on so-called alternative or Indigenous knowledge systems. As illustrated in section 2.2. and as argued by Todd (2016), Marquardt (2019) and others, it is especially Indigenous voices that are hardly heard in the Anthropocene discourse despite their potential to add valuable perspectives on the human-nonhuman relationship. This is surprising, as a great deal of current environmental challenges is believed to root in the modernist and Western estrangement from the nonhuman world (Harrison, 2014, p.204). Moreover, as natural history museums are eager to overcome, in the words of Nicole Heller, "the disconnected notion" that humans are "something outside of nature", it is valuable to consult and learn from ontologies that perceive the human-nonhuman relationships differently and more holistic. To recall the work of Descola (2005, 2013a), for instance, it makes a huge difference if nonhuman beings are perceived as different only in their body but as similar or kin in terms of consciousness and soul. This was also examined in section 5.3.2. when discussing the ethical consequences of perceiving animals as *beings* and not as objects.

Interestingly, out of all respondents, only Nicole Heller has explicitly addressed the Western roots of the museum's natural history knowledge and its implications for the perception of human-nonhuman relationships. Talking about how she wants to picture the positive future that can be created "through rethinking our relationship to other living beings", Nicole Heller notes that the museum's current narrative is dominated by Western thought:

> I think that we've been too focused on a story that is always pitting humans as a kind of negative entity, right? Like, we don't belong in nature. [O]r we are simply the destroyer of

> nature. I think that idea … that concept of our self, which is very much rooted in Western thought, is really problematic.

Even more, Heller clearly identifies the Western thinking as the origin of current environmental challenges:

> [I]t's not been working for us, right? We are in a crisis. And the path we've been on is unsustainable and this reductionist model of seeing things reduced to their parts and separated is also not really reflecting the world that we live in and the world that we kind of need to understand and cultivate for sustainability.

Consequently, she calls to "unravel that story" and strenghten new narratives of how humans "can [and] do relate to other beings in positive ways" and thus museums should look "to all kinds of different cultural practices". Even more, she acknowledges Indigenous peoples as knowledgeable in matters of environmental justice not only due to their cultural practices but especially due to their present-day involvement in these matters:

> And there's a lot we can do to […] work at this intersection of indigeneity as living cultures. And as people who are at the front lines of working for environmental justice. And so we're thinking very actively right now and we talk sometimes about the intersection between the Anthropocene and decolonization work and how can we kind of decolonize our museum to some extent.

It is not surprising that of all respondents it is the one of the only non-European institution who actively reflects on the value of Indigenous narratives and the link between the Anthropocene discourse and Western thought. The deep interconnection between Indigenous people, their rights and environmental injustice are unmistakably present all over the world. From the Standing Rock demonstration against the Dakota Access pipeline[29] to the controversies surrounding tourism in the Uluru-Kata Tjuta National Park[30] or the resistance of Brazil's Indigenous communities against

[29] Since 2016 the Standing Rock Sioux Tribe has reached international attention with its resistance against the Dakota Access pipeline crossing their ancestral homelands. In "defense of water and earth" the Tribe is demonstrating until today and "continues to shape national conversations about how our choices affect this planet, our home" (Faith, 2019).

[30] The Uluru-Kata Tjuta National Park is located in Australia and land of the Aboriginal Anangu people. In the landscape-centered of the Anangu people the prominent sandstone rocks Uluru and Kata Tjuta represent physical manifestations of heroic actions of their ancestors and therefore sacred. The increasing tourism, ongoing from the 1940s, caused conflicts between the spiritual and land-use practices on the one hand and touristic and governmental interests on the other hand. Activism from the Anangu people and protests in the context of the park's World Heritage Nomination has finally led to a park management driven by the Anangu people's holistic philosophy more balanced participation structures (Harrison, 2013, pp.118-127).

Amazonian deforestation[31] and many more – worldwide Indigenous communities are fighting for their rights and acknowledgment of their values and relationships with the environment. Heller connects this to the fact that "decolonization is obviously really big, at least here in the States". However, with the Saami people of Norway, Sweden, Finland and Russia being the only recognized Indigenous people in Europe (Lapland.fi, n.d.), these discussions and the awareness for Indigenous struggles and knowledge might be less present in Europe as in, for instance, the Americas.

Nevertheless, when prompted during the interviews and asked specific questions about the incorporation of Indigenous knowledge, the European curators and directors started to reflect on these issues as well and revealed interesting insights. The following section 5.4.1. will hereby analyze how museum professionals assess and perceive alternative knowledge systems and their value for natural history museums. Thereafter, section 5.4.2. traces some possible projects and strategies of museums to incorporate the Indigenous knowledge.

5.4.1. Natural History Museums and Indigenous Knowledge

The Finnish Natural History Museum is located in one of the countries that are home to Europe's only Indigenous group. Thus, it is an interesting starting point to analyze the perception of Indigenous knowledge among the merely European sample of natural history museums.

In short, "the Saami issue is not represented in our museum", as Anni Granroth confirms. She explains that especially within the climate change exhibition the team has considered to include the impact of climate change on Saami people. However, finally they decided not to do so:

> And then we decided that, no, we have a lot of different collections with other museums, like, National Museum of Finland and also the Saami museum Siida […]. And we meet each other a lot and talk about these topics and we made the decision that every museum takes these issues in their own perspective. Like, the ecological crisis is something that all the society's parts have to be involved with. And we represent it in our perspective. So of course, we have a limited space and limited resources.

Granroth goes on to explain how also other topics, such as social injustice, have been left out due to limited resources and to "keep that story clear". However, Granroth's response is focused on Indigenous issues and their struggles due to environmental destruction. When prompted to reflect more precisely on the inclusion of traditional ecological *knowledge* of the Saami people, Granroth once

[31] Brazil's Indigenous communities are forming resistance against right-wing president Jair Bolsonaro and his policy of extensively deforesting the Amazonian rainforests. Claiming that the president's policy is threatening their existence and "their relationships to the land, wildlife and water" the Indigenous communities are calling for international help to fight their government (Garcia, 2020).

again refers to the Saami museum Siida. While Granroth states that she would consider the implementation of Indigenous solutions in workshops or guided tours she does not believe that it will be implemented in the museum's exhibitions themselves. Again, this is due to matters of limited resources but in the first place it derives from the decision to stick to the own field and expertise:

> [W]e are talking about the Western people and the Nordic people […]. So that was one decision that we made that we don't have chance to handle so much about the different cultures and the way of living in different cultures cause we are not a historical museum. So the point is the nature and the history of it.

This notion, to stick to "our perspective", meaning the traditional field and expertise of the natural history museum is a tendency that can be noticed throughout most of the inquired museums. Camilla Tham's emphasizes how that does not mean to dismiss other aspects altogether:

> But of course, there'll be areas of this concept of the Anthropocene that are slightly less relevant for the museum, or we don't have as much of an authoritative voice on it. […] And so the museum … it's probably less likely to focus on some of those things, purely because it's not our area of expertise. It's not to say that's not important. And I would quite like to see the museum create a space for some of those discussions to still be had. But we wouldn't be able to lead or something like that. Because our experience is using the collections and our own scientific research.

As it became evident during the interview one of these areas the natural history museum considers outside their expertise is Indigenous knowledge. Once again, Tham emphasizes that they have been "fairly cautious about including content that doesn't really sit within our remit". Similarly, Linda Gallé emphasizes that natural history museums are scientific research institutions and how being home to particular researchers also shapes the topics and areas that are addressed in the museum's exhibitions. She states:

> Topics that are not part of our research are not included in the permanent exhibition. Additionally, only if it's a long-term research, the topic is included in the permanent exhibition - and there have to be objects from our collections that are able to speak for it.[32]

The museums' standpoint, to stick to their own expertise, can be traced back to the earlier outlined findings in section 5.1.. Namely, that natural history museums legitimate their authoritative voice and trustworthiness through their scientific research practice (see also Koster, Dorfman & Nyambe, 2018,

[32] Translated from German by the author.

p.30). Thus, to address topics outside their expertise means to risk their reputation and trustworthiness.

However, the question remains why this expertise consists seemingly mainly of Western based knowledge of natural scientists and there is little consideration of "critical scholarship of Indigenous thinkers whose work and labour informs many current trends in Euro-Western scholarship" (Todd, 2016, p.4) as criticized also by Zoe Todd. In other words, Indigenous knowledge is not a field distinct to natural history but instead it could add to natural history museum's expertise in the same way Western trained zoologists or mineralogists do.

Reflecting on the value of Indigenous knowledge to tackle environmental knowledge, Camilla Tham states that while "it is good to hear about different communities and different cultures who live alongside nature in a much more sustainable way", the current situation demands "some kind of systemic change to alter the trajectory of our planet". This, combined with the viewpoint that the contexts of different communities are often too far from each other, leads Tham to the conclusion that what really matters in the end is "how local communities can do better in their local space with the systems that they already are used to".

With this approach, Tham is not only in line with the earlier mentioned Biermann et al. (2016) who call for a more localized and context-dependent understanding of the Anthropocene (see section 2.2.) but reflects what many of the inquired natural history museums are already doing. Be it explicitly or implicit, the museum professionals highlighted how they tend to focus on local "nature" and local solutions with a national or regional focus. Granroth, for instance, emphasizes that the museum is "talking about the Western people and the Nordic people […] because that's something that every Finnish people can reflect with". The underlying argument hereby is that in order to be relatable for the local visitors and community, Western museums should focus on Western knowledge and Western people.

In opposition, Tinde van Andel, ethnobotanist and senior researcher at the natural history museum Naturalis in Leiden, points out how this understanding leads not only to natural history museums missing out on valuable knowledge but also on the opportunity to be - more - relevant to those parts of the society whose cultural heritage is distinct to the modernist Western one. Prompted to assess the necessity to include knowledge about Indigenous plant-use in natural history museums she answers:

> Enormous! Especially because Naturalis misses the connection with society in this way. Many traditional knowledge on plants is still present among citizens of the Netherlands: especially among migrants, who know lots of local names and uses of plants and animals but not often come to museums. Naturalis does not take up this opportunity to be relevant for much more people than it is today. Moreover, many of our historic collections were collected during the

> colonial period, so they form part of a cultural heritage of other people than the Dutch, but these people are not actively being engaged by the museum to provide context so their voices are not heard.[33]

As mentioned, one museum that is already quite far on this train of thought is the Carnegie Museum of Natural History. However, also here the practical implementation of this reflective thoughts and considerations is still at the very beginning. One source of hesitance is hereby the concern to fall in the trap of romanticizing Indigenous people, their lives, and their knowledge when addressing those narratives in natural history exhibitions. Nicole Heller explains:

> So, we're really interested in that, but we also don't want to do that in a way that kind of feeds into romantic myths, right? Could be a problematic myth of some people are kind of more … you know, any of this kind of primitivism or … you know, it's a little bit tricky in how you do that, so that you honor knowledge and these cultures as living cultures that are part of the modern world in every way that you and I are. And that they have a history and a knowledge and practices that are their traditional practices.

This concern to unintentionally reduce Indigenous communities to some form of myth or curious story unrelated to the Western reality is shared also by Stefan Schweizer and Camilla Tham. When reflecting on the differences between Western and Indigenous relationships to their nonhuman environment, Schweizer concludes:

> One is always easily trapped – and that's the cultural scientist in me – you're always easily trapped in this illusion of naturalness. So, that there is something such as natural interaction between natural beings.[34]

The same is true for Camilla Tham who is describing her struggle to compare different ways of being in the world when they are grounded in fundamentally different contexts and living conditions:

> [T]here are some Indigenous communities who live alongside and embedded within the natural world and quite a different way to people in say, London. […] I think it's important to be aware that there are different people and cultures in different parts of the world who have a more joined up, more connected way of living with the natural systems. But what I wouldn't want that to turn into is "That's a really interesting story but isn't that meaningful to me in my London life." We need to think about how people can learn from and be inspired

[33] Written interview. Punctuation and spelling are left as sent by the interview partner.
[34] Translated from German by the author.

> by one another. And it's so important that we understand how different communities are affected so differently with the global challenges we face.

This awareness of the pitfalls of talking about Indigenous narratives and knowledge is essential and important. Seemingly, many natural history museums are very cautios not to make the same mistake that is criticized by Fennel (2008) when he talks about the "Myth of Indigenous Stewardship" (see section 2.2.).

However, in line with Todd (2016) and as highlighted by Tham, it should not be the consequence of this cautiousness to leave out Indigenous narratives, perspectives and ontologies altogether - but to find ways to truly integrate this Other expertise into the institutional context of natural history museums (see section 2.2.). However, "as a very old, traditional Natural History Museum it will be a bit of a slow process", as Camilla Tham emphasizes. This assessment is shared by Tinde van Andel who criticizes that her field of research, ethnobotany, is not included in the museum's exhibitions at all, even though "Indigenous knowledge systems are taken seriously and studied scientifically" in ethnobotany.

> For Naturalis, it hardly plays a role, unfortunately. I am one of the few persons who thinks it is important and tries to link Indigenous or traditional knowledge to Naturalis collections. […] Naturalis is either not interested in their stories, scared to be accused of colonialistic behaviour, or old-fashioned in seeing nature as something we should only admire and not discuss any further as a source of food, medicine, traditional belief, part of language. culture, art, religion, etc. I am quite disappointed by this attitude. Luckily I have a few colleagues who are trying to change this attitude, but it goes very slow.[35]

Van Andel's dissatisfaction with the approach of the natural history museum she is employed in, is likely to be representative for quite some other natural history museums. Nevertheless, among the inquired museums at least three out of thirteen interviewed museum professionals expressed serious endeavors to work past these distorted perspectives and to re-think human-nonhuman relationships also with the help of Indigenous knowledge. The next section is therefore exploring some of the few projects at natural history museums who are trying to take this challenge and experiment with alternative knowledge systems and ontologies that are yet still unfamiliar to natural history museums.

[35] Written interview. Punctuation and spelling are left as sent by the interview partner.

5.4.2. Fostering Collaboration and Exploring Modes of Presentation

Even though being right at the starting point of this journey and despite all difficulties and concerns, there are already projects and strategies at natural history museums that explore modes of presentations to integrate alternative knowledge systems and ontologies. Hereby, two major types of strategies can be identified.

The first strategy, that was indicated especially by Schweizer and Tham, is to make use of digital spaces. For the new museum project at the natural history museum in Düsseldorf, Schweizer describes how it will be one of the main endeavors and challenges to merge and combine all kind of stories and knowledge. He illustrates how he strives to weave migration stories of both, people and of plants, and to put a link between, for instance, the collections, the location, the architecture, the museum and many more. While he is not yet sure how to perform this interconnectivity in practice, he mentions how the museum's website will serve as a space to present the collections in this interwoven context.

Schweizer might have not directly referred to Indigenous knowledge in this context, nevertheless his approach already indicates how digital spaces open up to possibilities for creative use where the physical implementation is not yet determined. This argument is supported also by Norris (2018, p.24-25) who argues that the use of digital spaces and digitalization of collections will have a transformative effect for the intersectional work of natural history museums across "a multitude of fields".

Camilla Tham, however, explicitly states how she considers the digital space as a good place to start addressing Indigenous knowledge. She reports that her colleague who is responsible for the digital content is currently working on the Anthropocene section or hub of the museum's website:

> I know [my colleague is] very keen to start experimenting with this fairly soon […] And at the moment, if you look there, most of the content in the Anthropocene hub is very much speaking to us and our science and our collections. […] But she's very interested in how that digital space, to some degree, can offer a platform for different areas of expertise, different voices.

Numbers proof that this digital starting point is more than just a good space to experiment but has significant relevance for the way the museums positions itself within the public discourse. Tham states that while slightly less than 5,5 million are visiting the museum each year, the reach of the museum's website is between 24 and 25 million. This is the result of the museums objective to "ensure that our website is much more of a natural history learning and discovery resource" and a place to "really engage people, get them inspired and excited" rather than a plain information site for visitors.

Heller (2018) emphasizes in a commentary article how with the increasing digitization of collections and growing online accessibility "museums will function as a massive, distributed research facility allowing a much greater diversity of researchers to engage", including Indigenous thinkers.

The second strategy is also the most obvious one. Namely, to collaborate with Indigenous people and thinkers when an exhibition is developed. Significantly, this is mostly done with temporary exhibitions. Similar to the digital space, temporary exhibitions are more flexible to experiment with and approach thematic areas that are not as represented in the museum's collections. Linda Gallé explains that while it is the philosophy of the natural history museum in Berlin to stick closely to the expertise of the museum's researchers in the permanent exhibitions, this is not the case for temporary exhibitions:

> What is interesting about the temporary exhibitions, is that you can address more current topics. Which are currently relevant to society […]. So, we *do* find it important that there is a reference to our institution. However, it is not as strict as with the permanent exhibitions. Meaning, you can also do a topic where not every aspect is related to our own research. Because it still fits somehow to our mission, to fascinate people for nature and to take part in current debates.[36]

Recalling that most of the interviewed museum professionals attested their institution a lack of expertise when it comes to Indigenous people and the incorporation of their knowledge, the statement of Gallé illustrates the great importance of temporary exhibitions. Here, museums are more open for external experts and less restricted to their own collections and research. In this sense, the barrier to actively consult Indigenous people and thinkers is less restrictive. This can be seen in two examples of temporary exhibitions among the inquired natural history museums that shall be briefly looked at in the following.

From May 2017 to November 2018, the natural history museum in Berlin displayed the temporary exhibition "ARA"[37] that addressed the threat of extinction due to habitat loss as it is faced by macaws in South America. The curators tried to bridge awe for the beautiful birds with the message that human impact and visitor's every-day decisions are causing its extinction. Touching upon many aspects of the macaw's life and even more on human's role in its biodiversity loss, one theme was also the utilization of macaws by Indigenous communities. Gallé recalls that these practices of Indigenous communities often collide with efforts of natural protection such as the work of the World Wide Fund For Nature (WWF). Inspired by external team members of the WWF who had joined the exhibition team in the brainstorming phase, the team got aware of a local project with Indigenous people in Bolivia and decided to get into contact. The motivation behind it is expressed by Gallé as follows:

[36] Translated from Germany by the author.
[37] "Ara" is German name for macaw.

> There is certainly the effort not to take a one-sided perspective. Of course, it is a difficult topic. Which needs should one put first? From the Western perspective, one would say you need to stop your cultural practices. No - one needs to find a way that can serve as a compromise.[38]

This compromise is thus to actively talk to the Indigenous people and implement their input into the exhibition in question. In case of the "ARA" exhibition this was a traditionally made feather crown of macaw feathers, and video material of the community's dances related to macaws and with the macaw feather crown. What is interesting, is that this encounter with an Indigenous community is reduced to the community's practices and dances. Deeper insights on how these Indigenous people perceive macaws, what relationship they maintain and what might be there to learn from are not examined or considered. This lack of more profound collaboration is even more surprising, as Gallé notes:

> In fact, it is not the Indigenous people's fault that the bird faces extinction. They have done [their practices] for hundreds of years. Only, now there are various factors coming together.[39]

Meaning, while the current extinction of macaws is primarily caused by increasing land use, deforestation and illegal smuggling of macaws, the Indigenous use of macaws had kept the balance for hundreds of years. Recalling the "Myth of Indigenous Stewardship" in section 2.2., this does not mean that Indigenous people's relationship to macaws and other nonhuman beings is per se one of equity or inherently better than other current usages. This would mean to fall for the image of the wise Indigenous protectors and stewards as it has been criticized before. Even more, Fennel (2008, p.134-137) gives evidence that in some cases the historic balance of Indigenous people and the beings they are hunting is essentially caused by lower human density in a region at a time and less-evolved hunting technology rather than some kind of ecological or holistic ontology.

There is too little insight on the case of the macaws in Bolivia to assess if that is true also for the practices of these Indigenous communities. Nevertheless, whatever output this exchange of knowledge with Indigenous people would bring forward, the discussions of section 2.2. have indicated that it is important to start the dialogue in the first place. Zoe Todd (2016, p.6) emphasizes how this dialogue is not only about traditional practices - in this case feather crowns and dances - but to acknowledge Indigenous people's laws, philosophies, knowledge systems and legal-political realities.

The second example and most innovative and far-reaching approach to integrate Indigenous perspectives and knowledge into natural history museums, was mentioned by Nicole Heller. What she calls the museum's "key collaborators" to acknowledge Indigenous knowledge and practices, is the

[38] Translated from German by the author.
[39] Translated from German by the author.

project “The Natural History Museum” by the activist art collective “Not an Alternative”. The collective’s aim is to use “cultural organizing and creative advocacy to build a more equitable and just society” (Not an Alternative, 2019). The Natural History Museum is both a travelling museum and an activist institutional transformation project directed at natural history museums worldwide but focused on North America. In partnership with Indigenous communities, the project strives to bring issues of environmental justice to natural history museums and therefore develops exhibitions and programs, organizes workshops and provides consulting to museum professionals. Central is the exploration of the question “how institutions of natural history can play a role as allies to Indigenous-led movements and tribal nations to protect natural and cultural heritage” (ibid.).

With this, the project is at the very heart of what has been discussed earlier in this section. During the interview, Nicole Heller expressed what she has learned when people of the Lummi Nation had brought a totem to the natural history museum in the context of one of The Natural History’s projects:

> And then they brought it to the Carnegie and each time they'd bring it around people touch it. And they sort of infuse it and share the energy. And the spirit of the struggle. And the totem is moved around. And we had it on display at our museum […] for three months along with an exhibit that The Natural History Museum […] organized. That had people talking about their relationship to the land. So Native Americans talking about awe to the water and how their whole spirit, their whole sense of self, their identities connecting to the water. [And] if the sea is sick, then they are sick. This interconnected identity between soul and environment.

The Carnegie Museum of Natural History wants to pursue this collaboration in the future, exploring the insights of Indigenous people on human-nonhuman relationships and working on the intersection of knowledge. Even more, the project has started the process of thinking how these insights can be included in the permanent galleries more directly.

In summary, there is indeed awareness and willingness among the inquired natural history museums to acknowledge and value Indigenous knowledge as a powerful source to tackle current challenges of the Anthropocene. In the words of Nicole Heller, these insights could teach natural history museums not to reduce the human-nonhuman relationship as characterized by human destruction but to enforce the consciousness of how “entangled we are with [other creatures] in our bodies, in ourselves, in our neighborhoods”.

However, all but one of the inquired natural history museums perceive this Indigenous knowledge as outside of their expertise. Despite their eagerness to include it somehow in their temporary and, on the long run, permanent exhibitions they have barely expressed the possibility of expanding the range of their expertise and make ecological Indigenous knowledge part of it. This, even though the insights

from Tinde van Andel have shown that the connecting point to Indigenous knowledge is sometimes already present within the institution's own research. Still, at least among the natural history museums which are explicitly addressing the Anthropocene as a reflexive discourse, one can notice notions of re-thinking and endeavor to review current practices and the knowledge that is used within.

6. Conclusion – Expanding Horizons

The world is trembling. Everywhere on Earth, species are facing habitat loss and suffering. Water and air are polluted, and the climate is changing in a way that makes life on this planet more and more difficult. An increasing number of living and nonliving *beings* and environments of this planet is irrevocably vanished or destroyed. The perpetrator of this imbalance is a species that is just like the others – but different. Humankind. Since the Neolithic era humans have started to significantly shape and impact their environment. To a point that humanity today has not only threatened the existence of uncountable nonhuman beings but is facing uncertainty of its own persistence as well.

This is the realization of a discourse that has developed surrounding the naming of the current geological epoch – the Anthropocene. The discourse is declaring an environmental crisis and gathers challenging questions of scientific, social and cultural relevance. It profoundly questions the modernist binary thinking of humanity and nature as distinct categories and demonstrates how the backfire of humanity's destructive agency on its environment has finally proved what people of less dualistic ontologies have long known: that humankind is deeply entangled with the nonhuman world rather than being an distinct entity - and that there is an urgent need to profoundly re-think *our* relationship to other living and nonliving beings on this world in order to counteract the environmental crisis of the Anthropocene.

This master thesis is concerned with the question if and how this consciousness has entered those institutions that have always dealt with the nonhuman world and which have contributed to the manifestation of the dualistic distinction of nature and humankind over the last centuries. Natural history museums, "the children of Enlightenment" (Johnson, 2018, p.xviii), are considered experts on the nonhuman world on the one hand but have long reenacted the dualistic estrangement of humans and nonhumans on the other. The research question - *How do natural history museum professionals present and reflect on human-nonhuman relationships in the light of the Anthropocene discourse?* - aimed to reveal the current level of reflection and implementation of this discourse into natural history practice in order to better understand natural history museums' position in this discourse and identify their potential to contribute to a more holistic understanding of human-nonhuman relationships.

To generate in-depth insights of how museum professionals think and talk about these topics, a qualitative research approach with semi-structured interviews examined the degree of reflectiveness on and the perception of human-nonhuman relationships among curators, directors, and other museum professionals.

Even though only two of the investigated natural history museums have dedicated resources explicitly to the exploration of the Anthropocene's meaning for museums, the results of this research show that there is a high degree of reflection, awareness and progressive thinking towards

Anthropocene topics present amongst the curators, directors and public engagement managers. In many cases, the museum professionals did not explicitly connect their reflective thoughts to the theoretical discourse of the Anthropocene but draw their considerations out of their own experience and practice at natural history museums. This is noteworthy, as it suggests that there are inherent characteristics of natural history museums that foster exactly those reflective moments which are gathered in the theoretical discourse of the Anthropocene. On the other side, the more explicit and comprehensive a museum has put the Anthropocene as such on its agenda, the more thorough are the interviewed museum professional's reflections on topics like interconnectivity or valorization of different knowledge systems – and the stronger is the call to re-think human-nonhuman relationships and explore more careful and holistic encounters with nonhuman beings in collections and exhibitions.

These overall trends suggest that both, the theoretical discourse on human-nonhuman relationships in the Anthropocene as well as the field of natural history museums, would highly benefit from a stronger exchange and collaboration. On the one side, the academic discourse can be enriched by involving the insights of people and institutions that have a long tradition in dealing with nonhuman beings, the interconnectivity of all living and nonliving beings on this planet and with fostering fascination for those. On the other side, the literature and theoretical work on human-nonhuman relationships and the Anthropocene, as outlined in chapter 2 of this master thesis, can serve as a powerful reflexive tool and inspiration for natural history museums to re-think their practices and engage in more careful and holistic approaches towards nonhumans. Moreover, given the strong association of the Anthropocene discourse with issues of societal relevance, natural history museums are an important protagonist to make the abstract theoretical insights accessible to a broader public and truly change humans' perception of and relationship with nonhuman beings.

Recent publications (Dorfman, 2018; Newell, Robin and Wehner, 2017), but also the ICOM NATHIST conference on "The Anthropocene: Natural History Museums in the Age of Humanity" in 2017, and the findings of this master thesis, indicate the process of negotiation between natural history practice and the Anthropocene perspective on human-nonhuman relationships is currently still at the very beginning (see section 5.1.). Furthermore, despite their high degree of reflectiveness, curators, directors and public engagement managers often struggle to translate the theoretical re-conceptualization of nonhumans into actual implementation into natural history museum practice. These struggles mostly ground in the assumed discrepancy of the museums' focus on and expertise in natural science and the social, cultural, political and moral implications of the Anthropocene discourse (see sections 5.3.3. and 5.4.1.). Natural history museum professionals rightfully claim that they do not want to use their authoritative voice outside their expertise and emphasize that this expertise derives from their collections. However, the findings of this research show that all those other facets of nonhumans and their relationship to humans – social, emotional, political - are often inherent in

exactly these natural history museums' collections, exhibitions and practices, but have not yet been realized or exploited by the museum professionals.

Most importantly, the Anthropocene's call to overcome the conceptional opposition of humans and nonhumans is for natural history museums a matter of course (section 2.1.). Humankind in natural history museums has long been treated as just another species, an example of Earth's history and undoubtedly connected to all other living and nonliving being on Earth (see section 5.2.1.). Only now - as natural history museums began to talk about the ecological crisis, the Anthropocene and human agency - humankind is addressed with different measures than nonhumans. The identified necessity to address the social, political and moral facets of human agency in natural history collections and exhibitions supports Latour's (2014a) postulation that in the Anthropocene humanities can no longer ignore "nature", and natural sciences cannot stick to the "natural" or biological side of humans anymore. However, if the de-naturalization of humans is not accompanied by an equivalent de-naturalization of nonhuman beings, the museums are at risk to fall for too anthropocentric narratives of the world and lose their strength to emphasize entanglement and interconnectivity (see section 5.2.3.). This is where the theoretical discourse of the Anthropocene, and especially the ontological turn, can provide museum professionals with conceptional tools to treat the social life, agency, and personhood of nonhuman beings with the same seriousness as they discuss bodily and naturalist characteristics. From Tsing's (2013, 2015) studies on the social life of fungi to the conceptional framework of perspectivism and multinaturalism as discussed by Viveiros de Castro (1998), or Descola's ontological grid (2013a) – there are various scholars that offer complementing frameworks to scientifically re-read the naturalist understanding of nonhuman beings that is practiced in natural science and at natural history museums.

Besides such conceptional frameworks, another inherent characteristic of natural history museums serves as a key point to re-think the traditional naturalist understanding of human-nonhuman relationships. Namely, the feelings of fascination and attraction that are sparked among the visitors through the beauty, diversity, and uniqueness of living and nonliving beings at the museum (see section 5.3.3.). These emotions are the very expression of the attached and holistic relationship with the nonhuman world that humanity needs to rediscover and that is missing in everyday life in modernist society. Based on the results of this study, it is therefore recommended that natural history museums make more extensive use of these positive narratives. Even more so, as the new practice of addressing humanity's impact on its environment usually provokes negative emotions among visitors – as reported by museum professionals (see section 5.3.3.) – which makes it difficult to bridge the strong emphasis on interdependency and negative human impact on one side and the vision of creating a positive future for all human and nonhuman beings on the other.

However, recalling the critique of Anthropocentrism (see sections 2 and 5.2.3.), it is to question if fostering positive emotions and attachment will be enough as it is still limited to a human perspective. To truly become advocates for a respectful and equal encounter with nonhumans it is necessary to push the change in perspective even further and start thinking of possibilities to display more nonhuman perspectives and create spaces where their voices can be heard – even though they are not manifested in human language or familiar modes of existence (Kohn, 2015; Latour, 2014b; see section 5.3.4.). While this is strongly emphasized in the reviewed literature, there is no equivalent of, for instance, Tsing's (…) … of the social life of fungi to be found among the researched natural history museums.

Only few examples of experimenting with this integration of nonhuman perspectives into exhibitions were found throughout the research. The most promising attempt hereby is the utilization of virtual reality that enables visitors to experience a nonhuman's – in this case a woodlouse's – perspective on the world and its encounters with other creatures (see section 5.3.4.). Without the need to explain or even mention seemingly abstract concepts - such self-reflective personhood (Descola, 2013b, p.197; Viveiros de Castro, 1998) or ontological differences in terms of the perception of interiorities and exteriorities – the use of virtual reality technology offers visitors a chance to develop understanding and compassion for *being* a woodlouse.

Another useful tool to break down the highly theorized concepts which inform the Anthropocene discourse and make them accessible for the wider public, is to stimulate aesthetic encounters and artistic interventions at natural history museums. Throughout the analysis the value of art for the transportation of Anthropocene issues became evident. The most explicit in section 5.3.2., where it is revealed that museum professionals perceive collaborations with artists to talk about the Anthropocene as more than the usual science communication. Not only does art offer a possibility to address the emotional and non-materialistic side of human-nonhuman relationships but one might also argue that art has the capability to address notions that lie outside of what is representable in cognitive or textual terms. However, this assumption needs to be tested sufficiently in further research, including not only a close analysis of artistic projects at natural history museums and their connection to the Anthropocene discourse but also the way they are perceived by visitors.

Where the findings of this master thesis attest a deficiency of reflectiveness is regarding the implementation of Indigenous knowledge. Living in the Anthropocene and facing an ecological crisis sheds new light on the importance to consider all available knowledge and truly learn from each other. However, among most of the interviewed museum professionals, Indigenous knowledge is not perceived as a source of knowledge to re-think human-nonhuman relationships and tackle environmental issues, but rather as lifestyles, traditions and practices which are then ascribed to the field of ethnology and outside of natural history expertise (see section 5.4.). Zoe Todd (2016) and other

scholars (Descola, 2005, 2013a; Viveiros de Castro, 1998), however, emphasize the value of knowledge, insights and experience of Indigenous thinkers (see section 2.2.). One starting point to close this gap is certainly to closely review natural history collections for links to indigenous narratives and knowledge. This strategy of reviewing and reassessing the collections is already successfully used to identify notions of human impact in "natural" collections (see section 5.2.2.). Additionally, as the insights given by ethnobotanist Van Andel in section 5.4.2. suggest, it might be valuable to listen more closely to the scientific expertise that is already present at the museums. Because just as in the case of collections, there might be valuable insights that have not yet been recognized due to the bias of the naturalist lens.

However, this master thesis has focused on the insights of curators, directors and public engagement managers at natural history museums. While this produced valuable results and a profound understanding of the presentation of human-nonhuman relationships in natural history museums and implications for future practice, the approach was clearly limited to *reflections about* those relationships rather than assessing the constitution of the displayed relationship itself. Throughout the research, the interviewed museum professionals often reflected overly critical on their museums' practices and underestimated or overlooked instances where exhibitions or displays already carried notions of, for instance, human agency or the value of nonhumans. This critical view was presumably intensified by the interview situation and the awareness that they are requested to actively reflect on human-nonhuman relationships in the museum of question. For this reason, a valuable follow-up study to this research would be a profound analysis of natural history museums' exhibitions in order to investigate what other interesting and valuable facets of the human-nonhuman relationships are addressed in natural history museums – of whose museum professionals are either not aware or which they perceive as so self-evident that they have not addressed it in the interviews.

To conclude, the Anthropocene discourse and its implications for re-thinking the human-nonhuman relationship has a strong resonance within the field of natural history. Museum professionals are currently starting to reflect on the way their institutions have long presented nonhuman beings and their interplay, relatedness and relationship with humans. Moreover, there is a strong willingness to do things differently and promote new perspectives and notions of this relationship in order to counteract the ecological crisis the Earth faces. Yet, in many ways they are caught within the disciplinary boundaries of natural science and natural history. Natural history museums characterize themselves as research institutions for natural science – drawing from the collections and concerned with fact orientated and naturalistic display of nonhuman beings. This is where they have gathered expertise over centuries; these are the attributes for which they earned their reputation; and this is where their authoritative voice is trusted in public and academic discourses. However, now that the Earth trembles under the destructive force of human agency and - as stated in the very first words of

this master thesis - humankind is “revealed as simultaneously insignificant and utterly dominant in the grand scheme of life on Earth” (Carrington, 2018), natural history museums can no longer stay within these established boundaries. Natural history museums’ expertise is of unmeasurable value for tackling Anthropocene issues - but researchers, curators, directors and other museum professionals should not be afraid to broaden the horizons and truly review what other stories their collections can tell and what knowledge they can generate. To take on new perspectives requires to challenge the limits of natural science and to explore the diversity of relationships that human and nonhuman beings maintain with each other from more perspectives than just a naturalist and human one. This means, to realize that natural history collections and exhibitions are full of nonhuman beings who are not only passive examples of evolution or taxidermy - but who also tell stories about kinship to other human and nonhuman beings; about mutual respect and care; and about the entanglement of all living and nonliving beings on Earth.

References

Adler, E.S. & Clark, R. (2011). *An invitation to social research: How it's done* (4th edition). Belmont, CA: Wadsworth Cengage Learning.

Alberti, B., Fowles, S., Holbraad, M., Marshall, Y. & Wittmore, C. (2011). Worlds Otherwise. Archeology, anthropology, and ontological difference. *Current Anthropology*, 52(6), 896-912.

Baer, H. (2017). Anthropocene or Capitalocene? Two political ecological perspectives. *Human Ecology, 45(*3), 433-435.

Barker, D.K. (1998). Dualisms, discourse, and development. *Hypatia, 13*(3), 83-94. doi:10.1111/j.1527-2001.1998.tb01371.x

Bennett, T. (1988). The exhibitionary complex. *New Formations, 4*, 73-102.

Bergdahl, E. & Houltz, A. (2017). Museum awakenings: responses to environmental change at the Swedish Museum of Natural History, 1965-2005. In J. Newell, L. Robin & K. Wehner (Eds.), *Curating the Future: Museums, communities and climate change* (pp. 217-229). New York, NY: Routledge.

Best, S., Nocella, A.J., Kahn, R., Gigliotti, C., & Kemmerer, L. (2007). Introducing critical animal studies. *Journal for Critical animal studies,* 5(1), 4-5.

Biermann, F., Bai, X., Bondre, N., Broadgate, W., Chen, C.A., Dube, O.P., . . ., Seto, K.C. (2016). Down to earth: Contextualizing the Anthropocene. *Global Environmental Change, 39*, 341-350.

Bittel, J. (2018). Face Time: Nicole Heller. *Carnegie Magazine*. Retrieved from https://carnegiemuseums.org/carnegie-magazine/summer-2018/face-time-nicole-heller/

Blond, K. (2018). Imagining the future. In E. Dorfman (Ed.), *The Future of Natural History Museums* (pp. 103-118). London: Routledge. https://doi-org.eur.idm.oclc.org/10.4324/9781315531892

Borelli, N. & Davis, P. (2012). How culture shapes nature: Reflections on ecomuseum practices. *Nature and Culture, 7*(1), 31-47.

Bussmann, R.W. & Sharon, D. (2006). Traditional medicinal plant use in Northern Peru: tracking two thousand years of healing culture. *Journal of Ethnobiology and Ethnomedicine, 2*(47). https://doi.org/10.1186/1746-4269-2-47

Butler, F.C. & Menzies, C.R. (2007). Traditional ecological knowledge and indigenous tourism. In R. Butler & T. Hinch (Eds.), *Tourism and Indigenous Peoples: Issues and Implications*. Oxford: Butterworth-Heinemann.

Bryman, A. (2012). *Social Research Methods* (4th edition). Oxford: Oxford University Press.

Callon, M. (1986). Some elements of a sociology of translation: Domestication of the scallops and the fishermen of St Brieuc Bay. In J. Law (Ed.), *Power, Action and Belief: A New Sociology of Knowledge* (pp. 196-223). London: Routledge & Kegan Paul.

Cameron, F. (2005). Contentiousness and shifting knowledge paradigms: The roles of history and science museums in contemporary societies. *Museum Management and Curatorship, 20*(3), 213-233. doi:10.1080/09647770500502003

Carrington, D. (2016). The Anthropocene epoch: scientists declare dawn of human-influenced age. *The Guardian*. Retrieved from https://www.theguardian.com/environment/2016/aug/29/declare-anthropocene-epoch-experts-urge-geological-congress-human-impact-earth

Carrington, D. (2018). Humans just 0.01% of all life but have destroyed 83% of wild mammals – study. *The Guardian*. Retrieved from https://www.theguardian.com/environment/2018/may/21/human-race-just-001-of-all-life-but-has-destroyed-over-80-of-wild-mammals-study

Cole, J. (2019). Welcome to the Anthropocene and the Age of Human Impact [blog]. *The Rockefeller Foundation*. Retrieved from https://www.planetaryhealth.ox.ac.uk/2019/06/05/welcome-to-the-anthropocene-and-the-age-of-human-impact/

Creswell, J.W. & Creswell, J.D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th edition). Los Angeles, LA: SAGE Publications.

Crutzen, P.J. (2002). Geology of mankind. *Nature, 415*(3), 23.

Dalby, S. (2020). Bordering Sustainabiltiy. In S. Dalby (Eds.), *Anthropocene geopolitics: Globalization, security, sustainability* (pp. 71-94). Canada: University of Ottawa Press. doi:10.2307/j.ctvx5w8dk.8

Davis, H. (2015). Life & death in the Anthropocene: A short history of plastic. In E. Turpin & H. Davis (Eds.), *Art in the Anthropocene: Encounters among aesthetics, politics, environments and epistemologies* (pp. 347-358). Open Humanities Press.

Davis, P. (2007). Ecomuseums and sustainability in Italy, Japan and China: Concept adaptation through implementation. In S. Hnell, S. MacLeod & S. Watson (Eds.), *Museum revolutions: How museums change and are changed* (pp. 198-214). London: Routledge.

Davis, P. (2008). New Museologies and the ecomuseum. In B. Grahamand & P. Howard (Eds.), *The Ashgate Research Reader in Heritage and Identity* (pp. 397-414). Alderhot: Ashgate.

Davis, P. (2019). The bear in the museum. In P. Davis, O. Nevin & I. Convery (Eds.), *The bear: Culture, nature, heritage* (pp. 107-118). Woodbridge, Suffolk, UK; Rochester, NY, USA: The Boydell Press.

Descola, P. (2005). *Par-delá nature et culture.* Paris: Éditions Gallimard.

Descola, P. (2013a). *Beyond nature and culture.* Chicago/London: The University of Chicago Press.

Descola, P. (2013b). *Jenseits von Natur und Kultur*. Berlin: Suhrkamp.

Dorfman, E. (Ed.) (2018). *The Future of Natural History Museums*. London: Routledge. https://doi-org.eur.idm.oclc.org/10.4324/9781315531892

Drew, J. (2017). Objects in view: taking a bite out of lost knowledge: shark's teeth, extinction, and the value of preemptive collections. In J. Newell, L. Robin & K. Wehner (Eds.), *Curating the Future: Museums, communities and climate change* (pp. 77-82). New York, NY: Routledge.

Dufresne-Tassé, C. & Pénicaud, P. (2018). Teaching in natural history museums. In E. Dorfman (Eds.), *The Future of Natural History Museums* (pp. 119-139). London: Routledge. https://doi-org.eur.idm.oclc.org/10.4324/9781315531892

Eagle, J. (2016). Climate Change and the confluence of natural and human history: A lawyer's perspective. *RCC Perspectives, 2*, 21-26.

Espeso-Molinero, P., Carlisle, S. & Pastor-Alfonso, M.J. (2016). Knowledge dialogue through Indigenous tourism product design: a collaborative research process with the Lacandon of Chiapas, Mexico. *Journal of Sustainable Tourism, 24*(8-9), 1331-1349.

Faith, M. (2019). Our fight against the Dakota Access pipeline is far from over. *The Guardian*. Retrieved from https://www.theguardian.com/commentisfree/2019/nov/15/dakota-access-pipeline-standing-rock

Fennel, D.A. (2008). Ecotourism and the myth of indigenous stewardship. *Journal of Sustainable Tourism, 16*(12), 129-149. doi:10.2167/jost736.0

Freedman, B. (1989). *Environmental ecology: the impacts of pollution and other stresses on ecosystem structure and function*. London: Academic Press, Inc.

Gan, E., Tsing, A., Swanson, H. & Bubandt, N. (2017). Introduction: Haunted landscapes of the Anthropocene. In A. Tsing, H. Swanson, E. Gan & N. Bubandt (Eds.), *Arts of living on a damaged planet: Ghosts and monsters of the Anthropocene* (pp. 1-14). Minneapolis, MN: University of Minnesota Press.

Garcia, R.T. (2020). Brazil's indigenous communities resist Bolsonaro. *Dw.com*. Retrieved from https://p.dw.com/p/3Vo5u

Garthe, C.J. (2018). The Natural Futures Museum: interactivity and participation as key instruments for engaging audiences. In E. Dorfman (Eds.), *The Future of Natural History Museums* (pp. 140-154). London: Routledge. https://doi-org.eur.idm.oclc.org/10.4324/9781315531892

Gee, A. & Anguiano, D. (2020). We created the Anthropocene, and the Anthropocene is biting back. *The Guardian*. Retrieved from https://www.theguardian.com/commentisfree/2020/may/05/we-created-the-anthropocene-and-the-anthropocene-is-biting-back

Ginn, F. & Demeritt, D. (2009). Nature: A contested concept. In N.J. Clifford, S.L. Holloway, S.P. Rice & G. Valentine (Eds.), *Key concepts in geography* (2nd edition) (pp. 300-311). London: SAGE Publications.

Grande, L. (2017). Curators: behind the scenes of natural history museums. London: The University of Chicago Press.

Hannibal, M.E. (2020). Considering nonhuman culture [Review]. *Science, 368*(6487), 384.

Haraway, D. (2003). *The Companion Species Manifesto: Dogs, People, and Significant Otherness*. Chicago: Prickly Paradigm.

Haraway, D. (2015). Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making kin. *Environmental Humanities, 6*, 159-165.

Harris, F. (2015). Understanding human remains repatriation: practice procedures at the British Museum and the Natural History Museum, Museum Management and Curatorship, 30(2), 138-153. doi:10.1080/09647775.2015.1022904

Haraway, D. (2016). Tentacular Thinking: Anthropocene, Capitalocene, Chthulucene. In D. Haraway (Ed.), *Staying with the trouble: Making Kin in the Chtulucene* (pp. 30-57). Durham: Duke University Press.

Harrison, J. (1993). Ideas of museums in the 1990s. *Museum Management and Curatorship, 13*(2). 160-176.

Harrison, R. (2013). *Heritage: Critical approaches*. New York, NY: Routledge.

Heller, N. (2018). Natural history museums have never been more necessary. *Apollo, The International Art Magazine*. Retrieved from https://www.apollo-magazine.com/natural-history-museums-have-never-been-more-necessary/

Holbraad, M. & Pedersen, M.A. (2017*). The Ontological Turn. An Anthropological Exposition*. Campridge: Campridge University Press.

Howarth, F. (2018). The future of research in natural history museums. In E. Dorfman (Ed.), *The Future of Natural History Museums* (pp. 65-81). London: Routledge. doi:10.4324/9781315531892

ICOM NATHIST (2016). Musée de la Nature in Sion, Switzerland, wins national prize for Anthropocene exhibition. Retrieved from https://icomnathist.wordpress.com/2016/12/18/musee-de-la-nature-in-sion-switzerland-wins-national-prize-for-anthropocene-exhibition/

ICOM NATHIST (2017). 2017 Conference Report. Retrieved from https://icomnathist.wordpress.com/2017/12/30/2017-conference-report/

ICOM Österreich (2017). NATHIST annual meeting: The Anthropocene, natural history museums in the age of humanity. Retrieved from http://icom-oesterreich.at/kalender/nathist-annual-meeting-anthropocene-natural-history-museums-age-humanity

Inoue, C.Y.A. & Moreira, P.F. (2016). Many worlds, many nature(s), one planet: indigenous knowledge in the Anthropocene. *Revista Brasileira de Política International, 59*(2), [online], https://doi.org/10.1590/0034-7329201600209

Jamir, Y. (2020). India: Climate emergency message resonates at world's largest literature festival – UN News special report from Jaipur. *News UN*. Retrieved from https://news.un.org/en/story/2020/01/1056212

Joanneum (2020). Die dünne Haut der Erde: Virtual Reality Erlebnis. *Museum Joanneum*. Retrieved from https://www.museum-joanneum.at/naturkundemuseum/ihr-besuch/programm/events/event/ 08.02.2020-5560/die-duenne-haut-der-erde-1

Johnson, K. (2018). Foreword. In E. Dorfman (Ed.), *The Future of Natural History Museums* (pp. xviii – xix). London: Routledge. https://doi-org.eur.idm.oclc.org/10.4324/9781315531892

Kadanoff, L.P. (2002). Sue's several heads: The evolution of the natural history museum. *Perspectives in Biology and Medicine, 45*(2), 272-280.

Kawami, T.S. (1986). Greek art and persian taste: Some animal sculptures from Persepolis. *American Journal of Archaeology, 90*(3), 259-267.

Keogh, L. & Möllers, N. (2014). Pushing boundaries: Curating the Anthropocene at the Deutsches Museum, Munich. In F. Cameron & B. Neilson (Eds.), *Climate Change and Museum Futures*. New York, NY: Routledge. https://doi-org.eur.idm.oclc.org/10.4324/9780203752975

Kohn, E. (2007). How dogs dream: Amazonian natures and the politics of transspecies engagement. *American Ethnologist, 34*(1). 3-24.

Kohn, E. (2013). *How forests think: Toward an anthropology beyond the human*. Berkeley/Los Angeles: University of California Press.

Kohn, E. (2015). Anthropology of Ontologies. *Annual Review of Anthropology, 44*, 311-327.

Koster, E., Dorfman, E. & Nyambe, T.S. (2018). A holistic ethos for nature-focused museums in the Anthropocene. In E. Dorfman (Ed.), *The Future of Natural History Museums* (pp. 29-48). London: Routledge. https://doi-org.eur.idm.oclc.org/10.4324/9781315531892

Lacey, J. (2017). The Pacific in New York: managing objects and cultural heritage partnerships in times of global change. In J. Newell, L. Robin & K. Wehner (Eds.), *Curating the Future: Museums, communities and climate change* (pp. 53-61). New York, NY: Routledge.

Lapland.fi (n.d.). Visit: Only in Lapland: The Sámi, Europe's only indigenous people. Retrieved from https://www.lapland.fi/visit/only-in-lapland/sami-europe-indigenous-people/

Latour, B. (1987). *Science in action: How to follow scientists and engineers through society*. Milton Keynes: Open University Press.

Latour, B. (1988). *The pasteurization of France*. Cambridge: Harvard University Press.

Latour, B. (2014a). *Anthropology at the time of the Anthropocene: A personal view of what is to be studied* [distinguished lecture]. Presented at American Anthropological Association Annual Meeting. Washington, DC.

Latour, B. (2014b). Agency at the Time of the Anthropocene. *New Literary History 45*(1), 1-18. doi:10.1353/nlh.2014.0003.

Law, J. (1999). After Ant: Complexity, naming and topology. *The Sociological Review, 47*(1), 1-14.

Law, J. (2011). Akteur-Netzwerk-Theorie und materiale Semiotik. In T. Conradi, H. Der-Wanz & F. Muhle (Eds.), *Strukturentstehung durch Verflechtung. Akteur-Netzwerk-Theorie(n) und Automatismen*. München: Fink.

Lenoir, T. & Ross, C. (1996). The naturalized history museum. In P. Galison & D. Stump (Eds.), *The Disunity of Science: Boundaries, Contexts, and Power* (pp. 370-397). Stanford: Stanford University Press.

Marquardt, J. (2019). Worlds apart? The Global South and the Anthropocene. In T. Hickmann, L. Partzsch, P. Pattberg & S. Weiland (Eds.), *The Anthropocene Debate and Political Science* (pp. 200-218). New York, NY: Routledge.

McGregor, A., & Houston, D. (2018). Cattle in the Anthropocene: Four propositions. *Transactions of the Institute of British Geographers*, *43*(1), 3-16.

Miles, R. (2007). A natural history museum in transition: Reflections on visitor studies in practice. *Visitor Studies, (10)*2, 129-135.

Möllers, N. (2013). Cur(at)ing the planet: How to exhibit the Anthropocene and why. *RCC Perspectives, (3)*, 57-66.

Murray, A.E. (2017). *Footprints in paradise: ecotourism, local knowledge and nature therapies in Okinawa.* New York, NY: Berghahn.

Natural History Museum London (2020a). Homepage: Anthropocene. Retrieved from https://www.nhm.ac.uk/discover/anthropocene.html

Natural History Museum London (2020b). Collections: Palaeoanthropology collection. Retrieved from https://www.nhm.ac.uk/our-science/collections/palaeontology-collections/palaeoanthropology-collection.html

Natural History Museum Vienna (2020a). Department of anthropology. Retrieved from https://www.nhm-wien.ac.at/en/research/anthropology

Natural History Museum Vienna (2020b). Exhibitions: Plan overview. Retrieved from https://www.nhm-wien.ac.at/en/exhibitions/permanent_exhibitions

Naturhistroiska riksmuseet (2020). Homepage: Mission Climate Earth. Retrieved from https://www.nrm.se/en/besokmuseet/utstallningar/uppdragklimat.346.html

Newell, J., Robin, L. & Wehner, K. (Eds.). (2017). *Curating the future: Museums, communities and climate change*. New York, NY: Routledge.

Newell, J. (2017). Talking around objects: stories for living with climate change. In J. Newell, L. Robin & K. Wehner (Eds.), *Curating the Future: Museums, communities and climate change* (pp. 34-49). New York, NY: Routledge.

Nimmo, R. (2015). Apiculture in the Anthropocene: Between posthumanism and Critical Animal Studies. In H. A. R. N. Editorial Collective (Ed.), *Animals in the Anthropocene: Critical Perspectives on Non-human Futures* (pp.177-199). Sydney: Sydney University Press.

Norris, C.A. (2018). The future of natural history collections. In E. Dorfman (Ed.), *The Future of Natural History Museums* (pp. 13-28). London: Routledge. https://doi-org.eur.idm.oclc.org/10.4324/9781315531892

Not an Alternative (2019). The Natural History Museum: We're hiring! Senior Native Organizer position with The Natural History Museum. Retrieved from http://notanalternative.org/2019/03/06/were-hiring-senior-native-organizer-position-with-the-natural-history-museum/

Nowell, L.S., Norris, J.M., White, D.E., Moules, N.J. (2017). Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods, 16*(1), 1-13. https://doi-org.eur.idm.oclc.org/10.1177/1609406917733847

Ohrem, D. & Bartosch, R. (2017). *Beyond the Human-Animal Divide*. New York, NY: Palgrave Macmillan. https://doi-org.eur.idm.oclc.org/10.1057/978-1-349-93437-9

Palinkas, L.A., Horwitz, S.M., Green, C.A., Wisdom, J.P., Duan, N. & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health Services Research, 42*, 533-544. doi:10.1007/s10488-013-0528-y

Pálsson, G. (2006). Nature and society in the age of postmodernity. In A. Biersack & J.B. Greenberg (Eds.), *Reimagining political ecology* (pp. 70-96). Durham & London: Duke University Press.

Pedersen, H. (2011). Release the moths: Critical Animal Studies and the posthumanist impulse. *Culture, Theory and Critique, 52*(1), 65-81. doi:10.1080/14735784.2011.621663

Pennock, H. (2018). Natural history museum security. In E. Dorfman (Eds.), *The Future of Natural History Museums* (pp. 49-64). London: Routledge. https://doi-org.eur.idm.oclc.org/10.4324/9781315531892

Preziosi, D. & Farago, C. (Eds.). (2004). *Grasping the World: The Idea of the Museum*. Aldershot/Burlington: Ashgate.

Rader, K.A., & Cain, V.E. (2008). From natural history to science: Display and the transformation of American museums of science and nature. *Museum & Society*, *6*(2), 152-171.

Reitzenstein, A. & Heilmann, F. (2020). Germany is not fit for a climate changed world, but it can still lead the way. Retrieved from https://www.euractiv.com/section/climate-environment/opinion/germany-is-not-fit-for-a-climate-changed-world-but-it-can-still-lead-the-way/

Ritzer, G. (Ed.). (2005). *Encyclopedia of Social Theory.* Thousand Oaks: SAGE Publications.

Rodriguez, J.E. (2020). Decolonizing or recolonizing? The (mis)representation of humanity in natural history museums. *History of Anthropology Review, 44*. https://histanthro.org/notes/decolonizing-or-recolonizing/

Rodseth, L. (2015). Back to Boas, forth to Latour: An anthropological model for the ontological turn. *Current Anthropology, 56*(6), 865-882.

Rudiak-Gould, P. (2017). “Peoples who still live”: the role of museums in addressing climate change in the Pacific. In J. Newell, L. Robin & K. Wehner (Eds.), *Curating the Future: Museums, communities and climate change* (pp. 67-76). New York, NY: Routledge.

Safina, C. (2015). *Beyond words: What animals think and feel*. Macmillan.

Safina, C. (2020). *Becoming wild: How Animal Cultures Raise Families, Create Beauty, and Achieve Peace.* Henry Hold & Co.

Sharp, H. & Foster, L. (2019). The photographer capturing mankind's impact on planet Earth. [video] *BBC News*. Retrieved from https://www.bbc.com/news/av/science-environment-49669971/the-photographer-capturing-mankind-s-impact-on-planet-earth

Sin, C. (2003). Interviewing in 'place': The socio-spatial construction of interview data. *Area, 35*(3), 305-312.

Stege, K.E. (2017). Object in view: *Jaki-ed* mat, Marshall Islands. In J. Newell, L. Robin & K. Wehner (Eds.), *Curating the Future: Museums, communities and climate change* (pp. 50-52). New York, NY: Routledge.

Swedish Museum of Natural History (2019). Exhibitions: The Human Animal. Retrieved from https://www.nrm.se/en/besokmuseet/utstallningar/djuretmanniskan.400.html

Teslow, T. (2014). Constructing race: The science of bodies and cultures in American anthropology. New York, NY: Cambridge University Press.

Todd, Z. (2016). An indigenous feminist's take on the ontological turn: 'ontology' is just another word for colonialism. *Journal of Historical Sociology*, 29(1), 4-22.

Todd, Z. (2017). Fish and Indigenous Law I Zoe Todd I Walrus Talks [video]. Retrieved from https://www.youtube.com/watch?v=IhubUdR5OBg

Tsing, A. (2013). More-than-Human sociality: A call for critical description. In K. Hastrup (Ed.), *Anthology and nature* (pp. 27-42). New York, London: Routledge.

Tsing, A. (2015). *The mushroom at the end of the world: On the possibility of life in capitalist ruins.* Princeton; Oxford: Princeton University Press. doi:10.2307/j.ctvc77bcc

Verinis, J.P. (2016). The mushroom at the end of the world: On the possibility of life in capitalist ruins Anna Lowenhaupt Tsing 2015 [review]. *Culture, Agriculture, Food and Environment, 38*(2), 131-135.

Viveiros de Castro, E. (1998). Cosmological deixis and Amerindian perspectivism. *The Journal of the Royal Anthropological Institute, 4* (3). 469-488.

Wheeler, Q.D., Knapp, S., Stevenson, D.W., Stevenson, J., Blum, S.D, Boom, B.M., . . ., J.B. Woolley (2012). Mapping the biosphere: Exploring species to understand the origin, organization, and sustainability of biodiversity. *Systematics and Biodiversity 10*(1), 1–20. https://doi-org.eur.idm.oclc.org/10.1080/14772000.2012.665095

Whyte, K. (2017). Indigenous climate change studies: Indigenizing futures, decolonizing the Anthropocene. *English Language Notes, 55*(1), 153-162. https://www.muse.jhu.edu/article/711473

ZDF (1971). Kloake Rhein: 50 Jahre Länderspiegel [video]. ZDF. Retrieved from https://www.zdf.de/politik/laenderspiegel/videos/50-jahre-laenderspiegel-kloake-rhein-100.html

List of figures

Appendix A – Overview of Data

A1. Overview of Respondents

Respondent	Position	Date	Length
Hub Kockelkorn	Project Manager	28.01.2020	0:46:17
Stefan Schweizer	Scientific Director and Museum Director	28.02.2020	1:41:18
Wolfgang Paill	Head of the Department for Natural History and Chief Curator for Zoology	02.03.2020	1:21:03
Linda Gallé	Curator at the Department of Exhibitions & Knowledge Transfer within the Science Programme Public Engagement with Science	09.03.2020	1:23:45
Maria Teschler	Former Director of the Anthropological Department	22.03.2020	1:02:48
Camilla Tham	Anthropocene Engagement Manager	23.03.2020	1:05:38
Alexander Fairhead	Exhibitions & Public Engagement Manager	24.03.2020	1:07:00 Audio file corrupt
Claes Enger	Project Manager of Exhibitions & Nature Interpretation	26.03.2020	0:42:11
Basil Thüring	Co-Director	30.03.2020	0:46:52
Anni Granroth	Educational Curator	31.03.2020	0:58:40
Tinde van Andel	Senior researcher	02.04.2020	written
Bram Langeveld	Curator	07.04.2020	0:48:56
Nicole Heller	Curator of Anthropocene Studies	27.04.2020	0:56:09

A2. Overview Criterions

Category	Museum	Criterion	Respondent
1	Natural History Museum London, Great Britain	- Anthropocene hub on website - Anthropocene engagement manager	Camilla Tham
	Carnegie Museum of Natural History, Pittsburgh, United States	- Anthropocene living room - Department of Anthropocene Studies - Recommended by previously interviewed respondents	Nicole Heller
	Museum für Naturkunde Berlin, Germany	- exhibitions „ARTefacts“ and „Parasiten“ - museum mission	Linda Gallé
2	Naturalis Leiden, Netherlands	- new museum project - recommended by previously interviewed respondents	Tinde van Andel
	Natural History Museum Basel, Switzerland	- new museum project - recommended by previously interviewed respondents	Basil Thüring
	LUOMUS Finnish Museum of Natural History, Helsinki.	- exhibition “Change is in the Air” on climate change - updating process of this exhibition	Anni Granroth
	Swedish Museum for Natural History, Stockholm.	- Climate exhibition (is currently updated) - Exhibition “Human Animals”	Claes Enger
	Natural History Museum of Denmark, Copenhagen	- New museum project with focus on environmental issues	Alexander J. Fairhead
	Het Natuurhistorisch, Rotterdam, Netherlands	- Exhibition “Dead Animal Tales”	Bram Langeveld
	Naturkundemuseum Graz (at Universalmuseum Joanneum), Graz, Austria	- Temporary exhibition „The Earth’s Thin Skin. Our Soil” - Difference of permanent and temporary exhibition	Wolfgang Paill
	Naturkundemuseum Schloss Benrath, Düsseldorf, Germany	- exhibition „Pallenberg collection“; especially because of the guided tour “Wie Menschen Tiere sehen” [English: How humans see animals”]	Stefan Schweizer, joined by master student and museum educator Jennifer-Melina Geier
	MUSEON, The Hague, Netherlands	- exhibition “One Planet”	Hub Kockelkorn
	Natural History Museum Vienna, Austria	- Anthropological collection “Mensche(en) warden” [English: Becoming human(s)]	Maria Teschler

A3. Exhibition analysis

On November 7th, the natural history museum in Graz (part of the Universalmuseum Joanneum Graz) was visited. 191 photographs were taken of both the permanent exhibition and the temporary exhibition "The Thin Skin of Earth – Our Soils" which is loaned from the Senckenberg Museum of Natural History in Görlitz. 46 of the taken photographs are considered relevant for the research and are listed below. The titles of the images are reflecting the content of the photographs or the title of photographed texts/labels (in *italics*).

List of photographs:

1. Impressum: *Dünne Haut der Erde*
2. *Land under Water*: humans search for resources (german)
3. *Land under Water*: humans search for resources (english)
4. *Rocks, The Archives of Our Planet*
5. People and rocks create archives
6. Display: Rocks on walls
7. *Arranged by Colour, Shape and Genesis*
8. *Lithotheque – an Archive of Colorful Stones*
9. *Giant Deer:* Humans are responsible for distinction
10. Display: Humans at the end of the evolution timeline
11. *Life on Land*: Humans as one of many unimportant examples of geological processes
12. Video on screen: "Versteinert, Gefunden, Präpariert, Präsentiert"
13. Text: How to deal with data
14. Display: minerals in vitrine
15. *In Ordnung gebracht* (put in order): Mineral classification
16. Display: exhibition rooms with mineral stones
17. *Mineral Classification*
18. Video screen: Interviews with ineralogists
19. Display: Discovery of the century (crystal)
20. *Discovery of the Century* (text)
21. *Styrian deposits, Then and Now:* Everything we need for our existence, survival and future life
22. Display: Minerals in a cell phone
23. *Indicator plants*
24. Display: classification of butterflies
25. *Similar Construction Blueprint Reveals Relationship*: comparison of humans and other mammals

26. *Species Evolve in Mutual Interdependence*
27. *Insects, a Success Story*: human's dependence on insects
28. Entrance board: *Die dünne Haut der Erde. Unsere Böden.*
29. Video screen: Daughter and father experience soil as a part of nature.
30. *Lebensräume:* Soil as habitat for animals (including humans), plants, etc.
31. Cartoon: Personification of insects who give information
32. Text board: Soils and humans – utility
33. Text board: Myth and religion
34. Cartoon: Fertility of soil
35. Cartoon: Insect tells how it came from South America to Germany
36. *Eine menschengemachte Katastrophe?* (A manmade catastrophy?)
37. *Doch unsere Lebensgrundlage Boden ist endlich.* (But soil, our basis of life, is limited)
38. Cartoon: land sealing from an insect's perspective
39. *Betreten verboten* (entrance forbidden): Tourism threatens animals in antarctica
40. Text board: Foreign trees
41. Text board: Spreading of mites
42. Board: overview of exhibition galleries at the museum
43. *Bodenorganismen wozu? Welchen Nutzen haben wir Menschen von den Tieren im Boden?* (Why organisms in soil? What benefit do we humans have from animals in soil?)
44. Text board: back in time people believed that gods make the plants grow
45. Video screen: *Mäusebegräbnis* (funeral of a mouse)
46. Video screen (Mäusebegräbnis): *The actors*

Appendix B – Interview Guide

Phase	Theoretical concept	Operationalization	Examples of questions (partly translated from German)
1	*Assessment of the respondent's knowledge on the theoretical discourse*	Questions on: • the exhibition concept and its context (if applicable) • the respondent's professional background • the museum's mission	"To start with, I would like to ask about the context of the Pallenberg collection and the background why the natural history museum is displaying an art collection." "What are the most important parts of this exhibition and what is its message?" "Could you explain what exactly is your field of activity here at the museum? I know that you curated the parasite exhibition – but besides that, what is your area of responsibility?" "As you are the only curator of the museum, could you start with telling me what is the mission of the museum and what are the themes it wants to address in the exhibitions?"
2	The Anthropocene (Crutzen, 2002; Alberti et al., 2011; Möllers, 2013)	• if not already known to the interviewer: a) is the respondent familiar with the Anthropocene? b) is the museum explicitly or implicit addressing the Anthropocene in its exhibitions? • which notions of the Anthropocene are addressed by the respondent: a) conceptional discourse? b) geological epoch? • How does the respondent locate natural history museums within the Anthropocene discourse?	"Is the museum talking (implicitly or explicitly) about the Anthropocene?" "You mentioned that the Anthropocene project is an interdisciplinary project. Where would you situate the natural history museums in this whole project?" "In what facets is the human found in the natural history museum?
	Overcoming dualisms (Harrison, 2013; Latour, 2014a; Kohn, 2015; Tsing, 2015)	Nature – culture/human: • how does the respondent use the term "nature"? • are humans understood as part of or distinct to "nature"?	"What are you talking about/referring to when you talk about nature?" "You say people's associations with natural history museums are

			reflecting a misleading image. What about the title of the institution? Is nature and natural history still reflecting what is done in natural history museums?"
	Human agency	• is the natural history museum addressing humans in exhibitions? If yes: a) in what kind of exhibition? b) to which extent? c) in what forms? d) is this a new phenomenon? e) do they address social and moral aspects? • how does the respondent assess the role of humans in: a) temporary exhibitions? b) permanent exhibitions? c) both compared? • how does the respondent rate: a) the suitability to address human agency/impact in natural history museums? b) the importance/necessity to do so?	"What role do 'humans' or 'humanity' play in the current exhibitions? Will this change in the new museum? "Is the way of displaying humans changing since you started to engage with the Anthropocene?" "Can you find the notion of human impact in the natural history museum - besides the climate exhibition and the other exhibition about the human animals? Where?" "You mentioned that you plan to engage more with the topics of the Anthropocene […] in special exhibitions, interventions, all of that. Would engaging with the Anthropocene mean a change for the permanent exhibitions as well? And the collections?"
	Display of nonhumans & nonhuman perspectives	• What kind of exhibitions/specimens = what kind of nonhumans are displayed? Context specific follow-up question to get information about the nuances and conceptualization of nonhumans	"Is that something that you would consider [this nonhuman perspective?]? Would it makes sense to include that perspective?" "What role - you tried to avoid the word emotion - but what role does the meaning of nature for people play in your approach?"
	Indigenous knowledge systems	• Are indigenous <u>people</u> addressed in the museum? a) in what context? b) to which extent? • How are indigenous people addressed? a) in terms of lifestyle, practices, traditions b) as pre-modern? c) as living cultures d) as scholars/source of knowledge?	"There are societies that are considered to have this holistic perspective, as you phrased it. That the human is part of a wider system. Can one find any of these perspectives in your exhibition?" "So, what you just said is in terms of the social issues that the Saami people face. Scientists are talking also about the traditional ecological knowledge of the Saami people. So that wouldn't be about the social

		• Is indigenous <u>knowledge</u> addressed? a) as alternative? b) as complementing? c) in what form? d) Is it displayed itself or does it inform a display? e) how does the respondent rate the relation of natural science and Indigenous knowledge? • If none of it is mentioned: a) would the respondent consider implementing indigenous knowledge? b) has the respondent already reflected on this? c) does the respondent rate indigenous knowledge as valuable for natural history museums?	problems, but more about the knowledge that the Saami people can offer. Have you thought about that somehow?" "In your field of expertise, how would you phrase the relation between (Western) natural science (e.g. botany) and Indigenous knowledge systems?" "Do these knowledge systems ('Western' and 'Indigenous') offer different kinds of insights on plants or are they complementary? How are these insights different or similar?" "How would you assess the value of Indigenous knowledge of the nonhuman (natural) world (e.g. plants) for Natural History Museums?"

Appendix C – Coding

C1. List of Codes

Museum practice & mission

Authoritative voice
- Expertise
- Trustworthiness
- Reputation
- People like to come
- Research institution
- Uniqueness

Public engagement
- Audiences
- Perception of the exhibition
- Digital engagement

Institution
- Documentation
- Limited resources
- Role of individual protagonists

Relevance/Staying relevant
- Staying relevant for the future
- Societal relevance
- Call for action
- Outdated displays/exhibitions
- Updating of exhibitions
- New museum projects

Mise en scene & Messaging
- At temporary exhibitions
- "Traditional" display
- Modes of display

Intersection
- of institutions
- of topics
- of collections
- of disciplines

Museum as heterotopia
- Critical thinking
- Creating dialogue

Collections

Topics
- Notions of change
- Natural history

- Perception of animals
- Evolution
- Environmental issues
    - Anthropocene
    - Urgency
    - Change of env. Systems
    - Conservation/protection of nature
    - Biodiversity/extinction
    - Climate

Type of collections
- Ethnographic collections
- Art collections
- Natural history collections
- Heterogeneity of collections

Objects
- Speaking objects
- Potential of animal sculptures
- Interpretation of objects

Other:
- Expertise/authority through collection
- Taxidermy
- Description of collections
- Advantages/Disadvantages of collections
- Making research transparent
- Scientific practice

<u>Knowledge</u>

Art/Aesthetics
- Different approach
- To attract new visitors
- Art and natural science
- Art as science communication
- Art to explore the Anthropocene

Academia
- Anthropology
- Humanities
- Natural sciences
- Deep history/science

Indigeneity
- Knowledge
- Traditions

Cultural production
- Eurocentrism
- Naturalism
- Cultural production of (natural) science knowledge

Humans & “nature”

Humans
- ‘Human’ in new exhibitions
- ‘Human’ in old exhibitions
- Uniqueness
- Destructive agency
- Human as a thread for environment
- Anthropological collections
- Moral and social agency

“Nature”
- Nature in change
- Cultural production of nature
- Re-thinking nature
- Local nature
- Depiction of nature
- Display of nature
- Nature as concept

Animals
- The *being* of animals
- Animals as relatable
- Special animals
- Ethics
    - Animal rights
    - Suffering
    - “Dead bodies”
- Habitat loss
- Extinction

Humans and animals
- Dialogue
- Living together
- Interdependency
- Different but same

Perspectives
- Nonhuman perspectives
- Human perspective on animals
- Human perspective on “nature”

Interconnectivity
- Of the natural system/Earth system
- Anthropocene
- Interdependency
    - “Nature” needs humans
    - Humanity relies on the nonhuman world
- Telling positive stories

C2. World cloud (indicating frequency of codes)