

Ontological Politics of the Anthropocene

José García Huerta



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Abstract

The physical world we live in is a complex and dynamic system that exists from the constant interaction of its elements. Certain variables of this system, that can be tracked down in time, show fluctuation within specific stable parameters for approximately the last 10,000 years, during the geological epoch Holocene, where life as we know it emerged and evolved. These conditions have changed in the last centuries, and some parameters like the amount of CO₂ in the atmosphere are way out of the boundaries where they moved for the last millennia. The driver of these changes are the activities conducted by the human species as a whole.

The allegations of a great human impact on Earth goes back to the late 18th century, when Georges-Louis Comte de Buffon (1780), claimed that “Finally, the entire face of the Earth has today the imprint of the human’s force” (ibid: 186). In 1854, the Welsh geologist Thomas Jenkyn suggested in his book “*The Human Epoch*” that the rocks called *Post Pleistocene* “might have been called *Anthropozoic*, that is, human life rocks” (Jenkyn, 1854: 313). Likewise, George Perkins Marsh (1864) called attention to the human imprint on the Earth in his book “*Man and nature, or physical geography as modified by human action*”. A decade later, the Italian geologist Antonio Stoppani used the same word as Thomas Jenkyn “*Anthropozoic*” to claim that the human species was “a new telluric force that for its strength and universality does not pale in the face of the greatest forces of the globe” (Stoppani, 1873; translated by Federighi & Turpin, 2012: 36).

In the last century, a growing number of scholars have called attention to the increasing scope and magnitude of the impact of human activities on the planet. The eminent Russian geochemist Vladimir Vernadsky (1945) argued that humans were deeply altering the chemical composition of the biosphere. In 1986, William Catton called attention to the increasing impact on the planet’s carrying capacity due to the

technological effects of what he called “*Homo colossus*” (Catton, 1986). More recently, the writer and environmental journalist Andrew Revkin (2016) claimed that, back in 1991, in a companion book for a climate change exhibition, he suggested that humanity was entering an age that might later be known as “*Anthrocene*”.

It was, however, only at the beginning of the new millennia that a call to recognise the planetary scale of the impact of human activities gained ground in the geological sciences, and in a growing number of disciplines and in the public spheres. This call was made by the Nobel Prize winner and atmospheric biochemist Paul Crutzen, and Eugene Stoermer, a biologist and diatoms specialist, who recommended the current geological epoch be named ‘Anthropocene’ to “emphasize the central role of mankind in geology and ecology” (Crutzen & Stoermer, 2000: 17). For Crutzen and Stoermer (*ibid*), evidence of the Anthropocene was found in the human population’s growth and its increasing exploitation of natural resources; in the extensive land use conversion and urban expansion; also in the high rates of biodiversity loss, ecosystems degradation and fish stocks depletion; and in the disruption of the geochemical cycles of nitrogen and water. Soon after the seminal publication of Crutzen & Stoermer (*ibid*), the Anthropocene concept started to ignite debates across an ever-increasing range of disciplines, including geopolitics (Dalby, 2007), biodiversity conservation (Braverman, 2014), global environmental law, governance, human rights (Kotzé, 2014a; 2014b; Biermann *et al.*, 2016), and the human existence as species (Roelvink, 2013; Malm & Hornborg, 2014) among many others.

This active response started in the academic spheres, but soon after it seeped into the public arena and even the International Commission on Stratigraphy (ICS) set a working group to analyse the possibility of ratifying the Anthropocene as a geological epoch and add it to the Geological Time Scale. The Anthropocene Working Group (AWG) is a component body of the Subcommission on Quaternary Stratigraphy (SQS), in turn a constituent body of the ICS.

The call to recognise the Anthropocene as a new geological epoch, is grounded on the increasing evidence of the impact of the human species on the biosphere. The following exercise of imagination helps us to highlight both the relatively short history of the genus *Homo*, and the incredible speed at which humans have increased the scale and scope of its influence on the Earth system, which today is larger and deeper than ever. If we imagine the history of the planet Earth as a 24-hour time-lapse, the *Homo habilis* appears in the last minute. The Holocene epoch is situated in the last quarter of a second; and the Industrial Revolution occurs in the last two thousandths of a second (Bonneuil & Fressoz, 2013). And it is only in this last two centuries that the human species have dramatically increased the imprint of its presence on Earth, driving it to conditions not seen in the last 10 millennia.

Currently, the amount of CO₂ in the atmosphere is at its higher levels of the last 4 million years (Bonneuil & Fressoz, 2013), the biomass of humans together with their domesticated animals account for 97 % of the total biomass of land vertebrates (Smil, 2011). The current species' extinction rate is taking biodiversity to the gates of the sixth mass extinction (Barnosky *et al.*, 2011); around 50 % of the largest river systems on the planet have been altered by dams, holding approximately 15 % of world's annual river flow (Nilsson *et al.*, 2005); human activity displaces more sediments than all natural processes combined (Wilkinson, 2005); and the biogeochemical cycles of nitrogen and phosphorus have been deeply altered, with consequences for the entire Earth system (Steffen *et al.*, 2015a). Ceballos, Ehrlich, and Dirzo (2017) mention that among the causes of the current rate of biodiversity loss, is the habitat destruction, overexploitation of natural resources, alien species, pollution and toxification.

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES, 2019) highlighted in its 2019 *Assessment Report on Biodiversity and Ecosystem Services*, that nature around the planet “has been significantly altered by human drivers” (IPBES, 2019:11). In the same report, the IPBES argue that over 85 % of wetlands are now lost, as well as 50 % of life coral cover,

with losing rates accelerating in the last decades. Regarding biodiversity, the aforementioned report states that the average abundance of native species have decreased in 20 % in the majority of terrestrial biomes. Overall, human activities are threatening around 25 % of the world's flora and fauna species, and unless decisive action is taken to stop the drivers of biodiversity loss, they can disappear in the near future. The human driven changes in nature are unprecedented, ranging from land and sea use being the largest in its global impact, to direct exploitation of organisms, climate change, pollution and alien species invasion.

In May 2019, the Anthropocene Working Group completed a binding vote on some key questions about its work, resulting that a majority agreed that the Anthropocene should be treated as a chrono-stratigraphic unit defined by a Global Boundary Stratotype Section and Point, and that the primary guide for the base of the Anthropocene be one of the stratigraphic signals around the mid-twentieth century of the Common Era. The process continue and the Anthropocene has not been formally defined as a geological unit within the Geological Time Scale (GTS), the AWG is working on a proposal to formalise it, therefore we are officially still living within the Meghalayan Age of the Holocene Epoch.

Even though the term Anthropocene has not yet been formally accepted by the geological scientific community, it is being heatedly debated in different academic disciplines and public spheres. Most scholars agree on this epoch being, somehow, marked globally by human activities. The eventual recognition of the Anthropocene might have a profound influence beyond the scientific sphere and the way that we see the world. The scientific and social recognition of the Anthropocene as a geological epoch can foster government's commitment with the environmental agenda.

The concept of the Anthropocene has become a buzzword within and beyond the academic spheres. Typing the word "Anthropocene" into the internet search engine 'Google©' yields more than a million hits, just in the English language alone. This gives an idea of why it's been suggested that "as a keyword, the Anthropocene is certainly promiscuous" (Yusoff, 2016:7). Now there are several journals dedicated to

the Anthropocene, and many conferences and workshops have been organised under its name. Within the Natural Sciences (NS), the debates around the Anthropocene are largely related to its scientific evidence; in the Social Sciences (SS) and humanities, the concept of the Anthropocene has triggered various debates, through which the scholars are trying to grasp its reality (Swanson *et al.*, 2015). The dramatic response of SS and humanities scholars to the concept of the Anthropocene can be understood from its potential implications on the totality of what it means to be human. As Eric Swyngedouw (2015) pointed out in a lecture at the "Humboldt Graduate School" in Berlin, "if we are indeed living in the Anthropocene, we can no longer say anything meaningful about the physical world without at the same time suggesting that is a world of social, political, economic and cultural too" (ibid). In the following sections, I broadly outline the debates taking place around the Anthropocene within the three study groups on which this research focuses. These debates are important to situate the further analysis and discussion of the present study.

This research work is based on the premise that concepts are key to the way we make sense of the world we live in, but also to the way we imagine a different world we would like to live in. Rather than having stable and fixed meanings, concepts are understood and interpreted in different forms. In this research I explore the different manners in which social science and natural science scholars, as well as environmental activists, interpret the concept of the Anthropocene. By doing so, I attempt to contribute to the dialogues and debates that theorise on this concept.

This dissertation uses the framework of "*ontological politics*" suggested by Annemarie Mol (1999), to explore the multiple realities of the concept of Anthropocene, that are being *enacted* by three study groups: Natural Sciences (referred from now on as NS), Social Sciences (referred from now on as SS) and the Environmental Activism (referred from now on as EA). According to Mol, the idea of ontological politics states that the reality of an object of study is actively shaped and constructed while interacting with it, and therefore it is multiple rather than given and fixed. Mol (1999) suggested that the multiple realities of an object can be

approached from the ways in which the object is being manipulated in practice. Drawing on Mol's idea of *ontological politics*, I seek to explore the multiple realities of the concept *Anthropocene* that are being *enacted theoretically* from the three study groups, and by so doing I aim to contribute to the dialogues and debates that try to make sense of this concept.

The most relevant findings of this work are that the concept of *Anthropocene* is multiple as it is being *enacted* and understood in various different ways within the disciplines of Natural Sciences, Social Sciences and Environmental Activism. Overall, it was possible to identify a main enactment of the *Anthropocene* in each study group. Within the Natural Sciences group, the "geological epoch" enactment prevailed; whereas in the Social Sciences it is being understood more as an "academic event" and in the Environmental Activism group as an "ideological shift".

Out of the three identified *enactments* of the *Anthropocene*, the geological epoch was the most complicated version to maintain due to the fact that the *Anthropocene* represents a large spectrum of phenomena of which humans are a key component. Therefore, it is practically impossible to delimit the *Anthropocene* as to be understood only as a new interval in the GTS. The enactment of the *Anthropocene* as a geological epoch clashes with both the academic event and the ideological shift, where the *Anthropocene* is understood in much wider terms. All three *enactments* coincided in arguing that humans are inextricably part of nature and, at the same time, the impact of their activities has reached a significant influence on the Earth system.

1. Introduction

The purpose of this research is to explore the multiple ontologies of the concept of the Anthropocene that are done *theoretically* within three study groups: Natural Sciences, Social Sciences and Environmental Activism; and to identify clashes and coincidences among these multiple versions of the Anthropocene.

Which are the ontologies of the Anthropocene that are being *done theoretically* within the natural sciences, the social sciences, and the environmental activism?

What are the coincidences and clashes between these multiple ontologies?

This research aims to contribute to the dialogues and debates about the current human impact on the Earth System and how the Anthropocene concept, which embeds this idea, is being constructed and understood within the spheres of NS, SS and EA. On these grounds, this publication is intended for scholars and students on Earth Sciences, Natural Sciences, Social Sciences; as well as Environmental Activists and the general public interested in exploring the current relationship of humanity with the rest of the natural world.

In Chapter 1, I present the ideological framework where the work is grounded. Chapter 2 outlines the debates around the concept of the Anthropocene that are taking place within the spheres of the Natural Sciences, Social Sciences and the Environmental Activism. In Chapter 3, I present the conceptual

framework of ontological politics developed by Mol (1999, 2002), on which I draw to suggest that the Anthropocene concept is being *enacted* in multiple ways among the three study groups. Chapter 4, presents the research methodology, data collection and analysis, as well as the positionality and limitations of the research. Additionally, I present and comment on the various *enactments* of the Anthropocene concept within the study groups. Finally, in Chapter 5, I draw conclusions for the research.

This research aims to contribute to theorising the politics imbedded in the multiple ontologies of the Anthropocene, and to foster the dialogues on the potential implications of enacting a particular Anthropocene ontology. The different versions in which the Anthropocene concept is being understood are relevant for the future relationship between humans and nature. The multiple ontologies of the Anthropocene may foster the necessary dialogues and conversations between different disciplines and social organisations that might avoid the concept to become a post-political 'opium of

the masses' (Swyngedouw, 2011). On the contrary, to explore the multiple ontologies of the Anthropocene contributes to a social and political critical analysis of the Anthropocene that may lead to re-politicizing the environmental debates (Lövbrand *et al.*, 2015); and to "radically disagree" (Swyngedouw, 2015), with the environmental discourses that talk about a dismal future only to make sure the urgency to act left no room for political disagreement.

1.2 Concepts do matter

Concepts are key to intuit and make sense of the world beyond what is obvious. This was pinpointed by the philosopher Ernst Cassirer (1944) as follows, "we cannot think without images, and we cannot intuit without concepts. Concepts without intuitions are empty; intuitions without concepts are blind" (*ibid*: 56). By shaping our understanding of the world, concepts influence not only the reality we live in, but that reality we aspire to live in. The concept of the Anthropocene has already been considered to be among the most influential concepts that call attention to the planetary scale of the impact

of human activities (Pálsson *et al.*, 2013). As well as have triggered a scientific paradigm shift with correspondent relevant changes in philosophy and politics (Maslin & Lewis, 2015), and a call to rethink the relationship humans-nature (Baskin, 2015). Christophe Bonneuil (2015) mentioned, so far, the stories we have told ourselves about the world have led us to the Anthropocene, and now the stories we tell ourselves about the Anthropocene are going to define what sort of world humanity will inhabit in the future (*ibid*). Similarly, Dona Haraway and colleagues, consider that the concept of Anthropocene challenges us to imagine what kind of humans, what kind of nature and what relationship between them "might be at the end of the world" (Haraway *et al.*, 2016:535).

Notwithstanding, as was suggested by Annemarie Mol (2002), concepts as objects of study have neither given nor *fixed* identities but contested and accidental histories and presents. Their identities might change as they are *manipulated, handled, and enacted* (*ibid*). Concepts are crucial to the way we understand the world.

1.3 Approaching reality as multiple

Annemarie Mol (1999, 2002) developed the concept of ‘ontological politics’ to study the multiple realities of an object as it is *enacted*; she considered that “the driving question no longer is ‘how to find the truth?’ but ‘how are objects handled in practice?’” (Mol, 2002: 5). Drawing on her ideas, I argue that the Anthropocene concept does not have a given identity or reality, but it is in fact *enacted* in multiple and contested versions, that is to say it has *multiple ontologies*. Whereas there is a large body of literature focused on environmental discourses (Detraz & Betsill, 2009; Adger *et al.*, 2005; Mert, 2009), less has been said about the multiple ways in which concepts, linked to the environment, are *thought, handled and enacted* (Randalls, 2014; Randalls & Simon, 2015). A More than a lustrum ago, Giovanna Di Chiro (2016) examined the ways in which the concept of the Anthropocene was used as a keyword in environmental studies and environmental politics discourse, focusing on keynote speeches. Nonetheless, as far as a thorough literature review allows me to claim, this research is the first study that approaches the concept of the Anthropocene as being multiple, using the interview as a method to explore its multiple ontologies. Conversely, this is neither a study about what scholars know regarding the Anthropocene, nor an attempt to *find the truth* about it. The purpose of this study is to explore the multiple ontologies of the Anthropocene concept that are being *theoretically enacted* within three spheres: social sciences, natural sciences and environmental activism; and how they relate to each other. By so doing, I seek to contribute to the dialogues and

debates that are making sense of the Anthropocene concept and their embedded implications. Following Donna Haraway’s claim that “it matters which stories tell stories, which concepts think concepts” (Haraway, 2015:160), I suggest that it matters which theoretical *enactments* do *Anthropocenes*.

2. The Anthropocene debates

2.1 The Anthropocene debates in the natural sciences

It goes without saying that the Anthropocene is an issue of NS and in particular of the geological sciences (abbreviated in what follows as GS), so much so that the Subcommittee on Quaternary Stratigraphy (SQS), the constituent body of the International Commission on Stratigraphy (ICS), and in turn the largest scientific organisation within the International Union of Geological Sciences (IUGS), established in 2009 the Anthropocene Working Group (AWG) with the task to develop a proposal to formalise it as a geological epoch. Broadly, there are two key requisites that any proposal of a new geological interval must fulfil; to have large and distinctive stratigraphic evidence and to be useful for the scientific community. Within the NS community, there are different opinions about whether the Anthropocene satisfies these requisites. Some scholars consider the proposal of the Anthropocene lacks sound stratigraphic evidence to comply

with the established rules and definitions to be ratified (Autin & Holbrook, 2012; Finney & Edwards, 2016; Gibbard & Walker, 2014; Walker, *et al.* 2015). Whereas other scholars consider a strong case can be made for the Anthropocene in stratigraphic terms to support its ratification as a new geological epoch (Zalasiewicz *et al.*, 2008; Zalasiewicz *et al.*, 2011a; Zalasiewicz *et al.*, 2011b; Waters *et al.*, 2014; Maslin & Lewis, 2015; Zalasiewicz *et al.*, 2015; Waters *et al.*, 2016, Head *et al.*, 2021). This debate involves the definition and use of specific geological terminology, in particular, that which corresponds to *chronostratigraphic* and *geochronologic* units (Finney & Edwards, 2016; Zalasiewicz, 2004), and the use of a Global Standard Stratigraphic Age (GSSA) rather than a Global Boundary Stratotype Section and Point (GSSP) to define the Anthropocene (Gibbard & Walker, 2014; Walker *et al.*, 2015; Zalasiewicz *et al.*, 2011a; Zalasiewicz *et al.*, 2011b; Zalasiewicz *et al.*, 2015). In this scenario, the AWG is expected to present a formal case to the voting members of the SQS, where it will be evaluated and debated. If approved, it will be forwarded to the ICS where again it will be discussed, and if then is further approved, it will finally be included in the Chronostratigraphic Chart/ Geological Time Scale, by the IUGS. This procedure can take decades and, in the case of the Anthropocene, it is only at the first stage.

The ICS rules set out that the onset of any interval in the GTS have to be recognisable by a worldwide synchronous marker. In the case of the Anthropocene, there have been many suggestions of possible starting points, ranging from the mastery of fire by humans around 2 million years ago (Glikson, 2013:89) to the “5:29:21 Mountain War Time (± 2 s) July 16, 1945” (Zalasiewicz *et al.*, 2015), the moment of the explosion of the first nuclear bomb at Alamogordo New Mexico, which was followed by similar explosions, leaving a recognisable worldwide radionuclide signal. And in between, there are other suggested onsets like the one known as ‘orbis spike’ marked by a dip in CO₂ levels with a minimum in 1610 (Maslin & Lewis, 2015); the early 18th century as ‘stage 1’ of the Anthropocene, to match it with the beginning of the industrial era (Steffen *et al.*, 2007); the mid-1950s, at the dawn of what is known as “the great acceleration” (Steffen *et al.*, 2015b); and the “bomb spike” marked by a peak in 14C in 1964 (Maslin & Lewis, 2015). It becomes evident that to choose an onset for the Anthropocene is not a simple task. Nonetheless, what can be confidently said is that if the Anthropocene is to be formalised, its onset has to be defined and whichever it would be, it will matter for the stories we tell about our relationship with the planet.

While it is clear that the Anthropocene is an issue of NS, and particularly of Geology, regarding its formalisation as a potential geological epoch, it is being used extensively in a wide range of disciplines and certainly interpreted in different ways. Under this scenario, Autin & Holbrook (2012) have questioned whether the Anthropocene is more of an issue of *pop culture* than stratigraphy. They also highlighted

the fact that the proposal of the Anthropocene as a new geological epoch, preceded the discovery of the stratigraphic evidence that would underpin its formalisation. Therefore, they considered that geologists “are left to map a unit conceptually rather than conceptualizing a mappable stratigraphic unit” (ibid: 61). More recently, Finney & Edwards (2016) expressed the same concern, stating “In contrast to all other units of the ICS chart, the concept of the Anthropocene did not derive from the stratigraphic record. It arose with Paul Crutzen” (ibid: 6). Paul Crutzen (an atmospheric chemist) and Eugene Stoermer (a biologist), drew their proposal based on evidence related to disruptions in the biosphere and atmosphere, not in stratigraphy, and as was highlighted in the introduction of this dissertation, it is evident that for them, the Anthropocene was also an ecological claim.

Whilst geology does not deal with ecological aspects, in the case of the Anthropocene there are undeniable ecological implications. Nonetheless, Autin & Holbrook (2012) have claimed that “global awareness about environmental change is a separate issue from the definition of

practical stratigraphic units that solve geological problems” (ibid: 61). In a similar vein, Finney & Edwards (2016) have recently questioned whether what GS have been asked to do, regarding the Anthropocene, is a political statement rather than assessing a possible geological unit. While these debates continue within the GS, Crutzen & Stoermer’s (2000) definition of the Anthropocene is being largely used in the literature as a reference to define the Anthropocene.

Geologists find themselves in a complicated situation; never before has the definition of a geological epoch gained the interest of scholars in other disciplines as the Anthropocene is doing. Maybe because never before has the potential onset of an epoch been so directly attributable to humans, nor as close in geological scale to the present time. In the words of Ellis & Trachtenberg (2013), a geologist and a philosopher respectively, the Anthropocene “is a concept that has moral content at its core, rather than being only a scientific concept with a detachable moral significance” (ibid: 123). In a similar vein, Rowan (2014) claimed that the Anthro-

pocene “is not simply a disputed designation in geological periodization but a philosophical event that has struck like an earthquake, unsettling the tectonic plates of conceptual convention” (ibid:447). It seems that geologists might recognise that with the Anthropocene, geology has become political (Yusoff, 2016; Swanson, 2016). Perhaps the membership of the AWG is a sign of that, which includes a lawyer, a historian, and a journalist.

2.2 The Anthropocene debates in the social sciences

Whether or not the Anthropocene will be formally ratified by the IUGS, the concept has been (and is being) prolifically debated within the SS and humanities; and it is not difficult to imagine the reason. The Anthropocene implies the recognition of such a profound influence of humanity on the Earth system that it is driving the planet into states unknown by the living species that evolved during, at least, the last 10,000 years. Therefore, not surprisingly, it has been suggested that the Anthropocene concept is a call to rethink the SS and humanities and the narratives about the world we live in (Rose *et al.*, 2012); not only this but also the political terms of Nature (Swynedouw, 2011), the notion of humans (Haraway *et al.*, 2016), the notion of history (Chakrabarty, 2009), the human history and agency in more than social terms (Hamilton *et al.*, 2015), and the origins and endings of humans “within a geologic rather than an exclusively biological context” (Yusoff, 2016:3). Furthermore, the Anthropocene has been suggested to represent “the public death of the modern understanding of Nature removed from society” (Lorimer, 2012:593). As well as the “end of science” understood as an endea-

your detached from social relations and practices of power (Baskin, 2015). It has also kindled debates around who are the *Anthropos* pointed out by the Anthropocene. Along with the complications that arise from presenting an undifferentiated humanity as its cause (Bonneuil, 2015; Malm & Hornborg, 2014; Meyer, 2016; Di Chiro, 2016), and the fundamental question of how we humans got to have such a large imprint on the planet (Ellis, 2015).

Dipesh Chakrabarty (2009) has argued that the Anthropocene is merging human history with the history of the planet. This statement takes us to scales of time and space that are incommensurable compared to our lifetime, and even our history as a species. Kathryn Yusoff (2013) put it in this way, “the concept of the Anthropocene is axiomatic of new understandings of time, matter, and agency for the human as a collective being and as a subject capable of geomorphic acts” (ibid: 781). But the Anthropocene also situates us in the present time and space, where the environmental phenomena that led its proponents to suggest it is recordable. Swyngedouw (2015) claimed that the Anthropocene does not hold the promise of an environmental and human catastrophe, as climate change does. It means the catastrophe has already happened. He also points out that the Anthropocene means “we are co-producers of the physical conditions of the Earth, and therefore this process of production is a political one, is about choice and is about conflicts and struggles over the various possible choices, and we cannot invoke nature to legitimise these choices” (ibid). Akin to Swyngedouw’s claim, Bruno Latour (2015) has suggested the Anthropocene makes evident a war “for the definition and control of the Earth: a war that pits – to be a little

dramatic – Humans living in the Holocene against Earthbonds living in the Anthropocene” (ibid: 151). Analogous, Haraway *et al.* (2016) argued that in the Anthropocene, neither humans nor nature are what “conventional science [and] classical anthropology [...] thought they were”, and therefore humanity faces the challenge of “radically rethink what nature, humans as well as the political and historical relationship between them might be at the end of the world” (ibid: 535). In light of this, it can be imagined why this concept has attracted so much attention and why the ways it is *enacted* and manipulated are relevant, not only to the scholars in the NS, SS, and the EA, but to the broad public.

Needless to say, the Anthropocene is providing an entry point to generate a wide range of debates and dialogues within the SS and humanities. It seems that scholars in these disciplines are not only eager to keep using it to foster new debates and reanimate old ones, but many of them are calling for multidisciplinary collaboration, being crucial to understand the Anthropocene’s implications (Malm & Hornborg, 2014; Pålsson *et al.*, 2013; Sörlin,

2012; Latour, 2015; Castree, 2015; Swanson, 2016; Brondizio *et al.*, 2016; Bai *et al.*, 2016). It is worth noting that the Anthropocene dialogues are growing rapidly¹,

akin to today's physical and social changes. Johnson & Morehouse (2014) argue that "what is at stake in the Anthropocene is the identification and articulation of a world whose social, political, and physical parameters are changing faster than our capacity to process and analyse them" (ibid: 441).

Undeniably, the Anthropocene posits the challenge of making sense of a world where social and physical realms are deeply intertwined and changing fast.

2.3 The Anthropocene as an issue of environmental activism

Naturally, environmental activism is about action, and as Richter (2012) pointed out, "the importance of concepts derives from their relationship to action. Neither political activity nor social behaviour can occur without a common stock of concepts" (ibid: 9), and in this regard, environmental concepts are not an exception. Marteen Hajer (1997) stated that concepts are key components of the discourses that are "produced, reproduced and transformed in a particular set of practices and through which meaning is given to physical and social realities" (ibid: 44). Hajer (1997) suggests that whether an environmental problem is regarded as an anomaly, depends on how the problem is framed and defined. He exemplifies this with the case of the concept of "acid rain" and how its definition played a fundamental role in the public understanding of that environmental issue, and the setting of potential solutions. More recent examples of the relevance of concepts to the understanding of environmental problems can be found in "climate change" (Randalls, 2014; Weingart, 1999; Oreskes & Conway, 2010; Hulme, 2014) and "sustainability" (Robert *et al.*, 2005; Mitcham, 1995; Meadowcroft, 2000; Kates *et al.*, 2005).

¹ According to a report of the online scientific citation indexing service 'Web of Science'™ the number of papers published during 2015 tripled those published during 2013. Consulted 05/08/2016

It is evident that it is extremely complicated to separate the Anthropocene concept from today's environmental issues, where growing concerns can be exemplified with the paper posed by geophysicist Brad Werner at the 2012 conference of the American Geophysical Union, whose bold title 'Is *Earth fucked?*' anticipated its content. Werner (cited in Hamilton, 2015) stated that the solutions that emerge within the dominant economic system cannot change the devastating effects caused by themselves, "only radical activism that disrupts the dominant culture –including 'protests, blockades and sabotage'– opens up the possibility that the Earth may not be f**ked" (ibid: 36). Considering that concepts are key to promote environmental activism and the Anthropocene concept encompasses climate change, biodiversity loss, land degradation and ocean acidification, among many other human-caused phenomena, it seems to have potential as a political tool to foster environmental activism. Nonetheless, its broadness can also be its weakness. By encompassing so much, it might lose political strength. However, as stated by political theorist and environmental politics scholar John Meyer (2016), that is still an open question:

"We must ask whether, and in what contexts, stories about the Anthropocene are likely to facilitate awareness, understanding, or action not already prompted by more established discourses about climate change. If we are to seriously pursue a politics in the Anthropocene, this question will remain one of the most important to ask, precisely because the answer is not at all clear." (Meyer, 2016:51)

It is too early to foresee the relevance of the Anthropocene concept for environmental activism. It has been suggested that "the scientific description of the Anthropocene throws us in spatial scales disconnected from political action and, even more, from

individual choices and responsibilities" (Maris, 2015:129). But also, the Anthropocene concept might be an opportunity to inform the public about the pervasive human imprint on the Earth system and the necessity to take action to change it (Braje & Erlandson, 2013). What is true is that among the geological forces, humans are the only ones that express will and make decisions (Hamilton, 2015); and making decisions entails responsibility. It is because of this that I became interested in including environmental activists as part of this study. However, after a careful research on the websites of many environmental NGOs and environmentalists, at the time of writing this review I was unable to find environmental activists' publications related to the Anthropocene. Despite that, I considered it worthwhile to include this group to find out how are they making sense of the Anthropocene.

Understood as it is in different ways, the Anthropocene can be used to underpin different narratives around our collective impact on the Earth system. Some scholars have suggested we should become effective

stewards of the planet (Steffen *et al.*, 2011). Or even to get ready to take care of *Mother Earth* instead of her taking care of us (Ellis, 2011). Crutzen & Schwägerl (2011) argued, in an *online* article, published by YaleEnvironment 360, (a publication of the Yale School of Forestry & Environmental Studies in USA), that “it’s no longer us against ‘Nature’. Instead, it’s we who decide what nature is and what it will be”. The narratives which present humans as rising above the Earth (Malm & Hornborg, 2014) can be used by the advocates of large scale, technological interventions to foster its unilateral deployment (Baskin, 2015). On the other hand, other commentators suggest that the Anthropocene represents “an overwhelmingly disastrous picture of human behaviour and human presence on earth” (Di Chico, 2016:363), such that we must try to make it end as soon as possible, and so imagine and create epochs that can give refuge (Haraway, 2015) and find our way ‘back to earth’ in the new time and space the Anthropocene opens (Latour 2015).

3. Ontological Politics

This dissertation explores the multiple versions of the Anthropocene, *enacted* within three study groups – SS, NS and EA – drawing on the framework of “ontological politics” developed by Mol (1999), who explained that in common philosophical understanding, the term ‘ontology’ stands for “what belongs to the real, the conditions of possibility we live with” (ibid: 74-75), which when coupled with the term “politics” suggests that:

“The conditions of possibility are not given. That reality does not precede the mundane practices in which we interact with it but is rather shaped within these practices. So the term politics works to underline this active mode, this process of shaping and the fact that its character is both opened and contested” (Mol, 1999:75).

Mol (1999) claimed that rather than being given, reality is *done* and can be located historically, culturally, and materially, and therefore it is multiple. This shift from “ontology” to “ontologies” was fostered by Actor Network Theory (ANT) and what Mol calls its “semiotic relatives” (ibid: 74) to emphasise that “the reality we live in is one performed in a variety of practices” (ibid: 74), suggesting that reality is neither stable nor universal. For Mol (2002), the multiple realities of an object of study can be understood from the way in which it is manipulated in practice. In her book *‘The Body Multiple’* she sought to understand atherosclerosis through the different practices in which it was manipulated in a hospital in The Netherlands. Her study lasted four years and included observation of medical consultations; laboratory analysis; conversations with doctors

and patients; and many other empirical observations around which she described the different “*enactments*” of the atherosclerosis. Mol (2002) chose the word *enact* to suggest that the objects of study are in the acts where they take place. To this point, it is important to make clear that, this research is not based on empirical observations of practices of the Anthropocene to explore its multiple ontologies. In turn, this research uses semi-structured interviews to explore the multiple realities of the Anthropocene that are *theoretically* being done, which I consider as *theoretical enactments* of the Anthropocene. By approaching the concept of the Anthropocene as being *theoretically done in multiple versions* rather than *observed as having a single given reality*, this research aims to contribute to the dialogues and debates around the understanding of this concept.

This research draws on the following premises, framed within the concept of ontological politics developed by Mol (1999, 2002):

- The concept of the 'Anthropocene' does not have a *fixed* ontology.

Multiple versions of its reality are being *enacted* and *done theoretically* by natural and social science scholars, and as well by environmental activists. And these multiple ontologies clash and coincide in different aspects.

3. Methodology

In this chapter, I present the conceptual bases that underpin the choice of the used data collection method and analysis, to answer the research questions (Johnston *et. al.*, 2009; Graham, 2005). This research uses an interpretivist and descriptive conceptualisation to explore the ways in which social and natural science scholars, and environmental activists, *theoretically do / enact* the Anthropocene concept, and how these multiple *enactments* converge and diverge.

3.1 Exploring the Anthropocene concept as being multiple

Although this research draws on the concept of “ontological politics” developed by Mol (1999, 2000) it does not attempt to replicate her ethnographic methodology. The approach employed to explore the multiple versions of the Anthropocene concept is similar to that used by Randalls (2014) to explore the multiple ways in which climate change is “*enacted*” through three governance practices, and how these multiple *enactments* relate to each other. Randalls (*ibid*) concluded that the different governance practices do not appear to be different solutions for a single problem, “but rather function as different ways of thinking, writing, doing, practising and enacting climate change” (*ibid*:240). Using a similar approach, Randalls & Simon (2015) explored “the diverse mobilizations of resilience thinking” (*ibid*: 3). The authors drew on the literatures of socioecological systems, security, health, psychology and religion to outline these *diverse mobilisations* and how they “diverge and hang together” (*ibid*: 4),

and by so doing they brought out their different geographical and political implications. Similar to Randalls (2014), I explore the different ways in which members of the three study groups: SS, NS, and EA, enact the Anthropocene concept. However, unlike Randalls (*ibid*), I examine these *enactments* through semi-structured interviews rather than reviewing the literature. Nevertheless, the literature reviewed on the Anthropocene (chapter 2) is key to situate the further analysis of the collected material. Akin to Randalls & Simon (2015), I outline how the multiple *enactments* of the Anthropocene diverge and converge with each other. However, the identification of the political implications of the multiple ontologies of the Anthropocene concept is beyond the scope of this research.

3.2 Semi-structured interviews

In light of the aforementioned, a qualitative methodological approach seemed to be appropriate as it elicits the discursive constructions of what people say (Graham, 2005) and allows the researcher to focus on the way people “make sense of their experiences and the world in which they live” (Holloway & Wheeler 2002:3). Among the qualitative methods, the interview considers respondents to be ‘meaning makers’ rather than passive sources from which to extract information (Warren, 2001; Rubin & Rubin, 2005). Furthermore, it allows the interviewer to “go back over the same ground, asking the same questions in different ways in order to explore issues thoroughly” (Valentine, 2005:111). The interview also helps to cover the relevant topics, while granting space to the interviewee to raise issues that might have not been foreseen by the researcher, and which can potentially enrich the information collected (Silverman, 1993 cited in Valentine, 2005; Willis, 2006). In particular, the semi-structured interview is considered to allow the researcher to

delve into the intimate understanding of people and their social worlds (DiCicco-Bloom & Crabtree, 2006; Warren, 2001; Hermanowicz, 2002). Taking this into account, I considered the semi-structured interview as an appropriate method to answer the research questions.

3.3 Study groups and recruiting process

The sampling was purposeful, and all members of each study group were considered “information rich cases” (Coyne, 1997:627). The recruiting process of social and natural sciences participants consisted of sending invitations via email to scholars who had published articles relating to the concept of the Anthropocene, ensuring in this way the participation of representative members of each discipline. In the case of the environmental activists, invitations were sent to 15 different NGOs and individual environmentalists with presence in the United Kingdom, considering them to be representative of the environmental activism sector. Most of the contacts were found from their websites and others via personal recommendations. It was difficult to get environmental activists to participate, in most cases the answer from the NGO representatives was a lack of time. It is worth noting that out of the three participants in this category, two were recruited via personal recommendations and only one via website. In all cases, a snowball technique was utilised, but it did not produce any results. The only limitation to recruit participants was the requirement to conduct the interview either in English or Spanish.

3.4 Positionality

My position as an interviewer was that of the researcher interested in knowing the thoughts of my interviewee, trying to encourage her/him to speak about the topics opened up by the questions used to guide the conversation. The interviewees were certainly experts on their respective activities, but since the Anthropocene cuts across all that has to do with humans there are not necessarily “experts” on the Anthropocene. I did not attempt to treat my interviewees as such, but as individuals whose activities are linked to the topic and who are making sense of the concept within their fields, with their theoretical tools, and from their backgrounds and experience. My background as a biologist and my current studies on the relationship between environment, science and society facilitated me to connect with the respondents, by understanding their parlance, which produced rich and detailed conversations (Valentine, 2005). I recognise my positionality by reflecting on my own thoughts about the Anthropocene and how they might shape the interactions with my interviewees. I sought to conduct what England (1994) described as a “self-critical sympathetic introspection and the self-conscious analytical scrutiny of the self as a researcher” (ibid; cited in Valentine, 2005:113). Although I enact a version of Anthropocene from my background, I tried neither to let it permeate to the research design nor to the interviews.

3.5 Data collection

A total of 17 participants contributed to this study (see Table 1): 14 were interviewed via skype, as they were geographically distant from London, 2 interviews were conducted face to face, and 1 participant contributed by answering the interview guide via email.

Table 1. Research participants per study group, and residence.

Study group	Number of participants	Place of Residence
Natural scientist	7	Spain, United Kingdom, United States of America.
Social scientist	7	Sweden, Denmark, United Kingdom, United States of America.
Environmental activists	3	United Kingdom.

The interviews lasted between 25 minutes and 1 hour. An interview guide was used to enable the interview to follow a systematic structure but without being limitative, so the interviewees could feel comfortable to bring their insights into the topic and enriching the data collected (Burnett, 2009). The questions on the interview guide were designed, drawing on the academic literature on the Anthropocene to help the conversations flow as to answer the research questions. An initial series of questions were piloted in the first interview and, as the research proceeded, the questions were rephrased, as better ways to express them were identified. Finally, a consent form was used to get written consent from all participants and to ensure anonymity.

3.6 Data analysis

After a careful literature review, it seems that this is the first time semi-structured interviews have been used as an approach to explore the reality of a concept as being multiple, and so it was not possible to compare or relate this particular approach to previous studies. Therefore, the following process was conceived as an appropriate way to analyse the collected information in order to obtain warranted answers to the research questions. It is important to note that this analysis technique relies on “meaning making” from the participants. The data collected were first transcribed and then analysed using *Qualitative Content Analysis*, which is considered appropriate to analyse descriptive research (Hsieh & Shannon, 2005). This type of analysis is useful to look at the data from different angles that allow new aspects of the data to be revealed (Schreier, 2012). There are many definitions of content analysis, however for the purposes of this research the suggestion made by Weber (1990) was followed, that “there is no simple right way to do content analysis. Instead, investigators must judge what methods are most appropriate for their substantive problems” (ibid: 7). In this regard, the following process was designed and conducted as a suitable analysis for the purposes of this research.

Prior to initiation of the analysis, the interview transcripts were read several times to become immersed in them. The coding frame was drawn from the research questions, while keeping it flexible in order to allow the addition of new categories as they became evident during the analysis process. This approach was chosen considering that, in qualitative content analysis, it is usual that, due to the richness of the data, unanticipated relevant categories can emerge (Schreier, 2012). The first stage of the coding process consisted of the identification and reduction of the data to the themes relevant to the research question (Burnett, 2009; Coffey & Atkinson 1996; Schreier, 2012; Weber, 1990). In the second stage the themes were classified into encompassing categories, which represented the different *enactments* of the Anthropocene, identifying connections between them and the relevant literature (Schreier, 2012). To this point, the original data set was revisited to make sure no relevant themes were left out of the analysis. Representative extracts from the transcripts are quoted anonymously to support the discussion of findings.

The validity of the coding frame was ensured through an adequate representation of the research questions in the obtained categories (Schreier, 2012); since qualitative research implies certain levels of interpretation, it is acknowledged that different interpretations of the same material can be valid (ibid). Although in the case of the analysis reliability, it was not possible to prove it because I was the only coder involved. Nonetheless, due consideration was taken on the code design to maximise the coherent understanding of the collected material and so underpin its reliability.

3.7 Limitations

In some cases, it was challenging to keep the interview on the concept of the Anthropocene, as some interviewees, mostly in the NS group, started to delve into very detailed scientific explanations about environmental processes. Sometimes rather than answering a question, some interviewees quoted other scholars, in which case it was impossible to consider that answer as an *enactment* of the interviewee. Finally, I acknowledge that my skills as interviewer can be improved, which would result in richer collection of information.

It is important to mention that, due to the small size of the sample, the different versions of the Anthropocene concept identified in this study cannot be considered to represent definitive ontologies of the Anthropocene of each of the three study groups. In turn, they are to be considered part of the multiple Anthropocene's ontologies that are *on the making* within these groups.

4. The multiple versions of the Anthropocene

In the following section I present the three different versions of the Anthropocene that were identified as *enacted* by the interviewees: ‘*The geological epoch*’, ‘*The academic event*’ and ‘*The ideological turn*’. In spite of not being an enactment of the Anthropocene, a fourth theme, is outlined, named: ‘*The Anthropos of the Anthropocene*’, where I present the interviewees’ answers to the question: ‘who are the *Anthropos* of the Anthropocene’. I considered that the question of who are to be understood as the *Anthropos* of the Anthropocene, is relevant to the understanding of the multiple *enactments* of the Anthropocene, as its answer helps to make sense of both its causal agent and onset.

Considering that anonymity was granted to the interviewees, in this chapter quotations from respondents’ transcripts are simplified using letters and numbers; ‘W’ is used for the group of environmental activists, ‘R’ natural scientist and ‘M’ for social scientist, all followed by a number.

GS- Geological sciences

SS- Social sciences.

EA- Environmental activism.

4.1 The geological epoch

Although interviewees across all three groups recognised the Anthropocene as a geological epoch, it is not surprising that this particular enactment was conveyed by NS respondents, most of whom conveyed similar and blunt definitions that overall defined it as “an irreversible and synchronous

change to the Earth system, noticeable in the stratigraphic record, which emerge as consequence of human activities”. At the same time, these respondents pointed to the mid-20th century as the possible onset of the Anthropocene. It is worth noting that different starting points for the Anthropocene have been suggested around the mid-20th century, as was reviewed in chapter 2: Steffen *et al.* (2015) suggested 1950s, Maslin & Lewis (2015) suggested 1964 and Zalasiewicz *et al.* (2015) proposed 1945. The latter suggested onset was described by one NS interviewee as “*a completely social construct that has no stratigraphic evidence.*” (R6). Whereas another NS interviewee believed the geological definition of the Anthropocene is untimely, due to the fact that its geochemical evidence is still forming, and its preservation is uncertain (R7).

This argument reflects the debates reviewed in chapter 2 around whether, or not, there is enough sound stratigraphic evidence to ratify the Anthropocene as a geological epoch (Autin & Holbrook, 2012; Finney & Edwards,

2016; Gibbard & Walker, 2014; Walker *et al.*, 2015; Zalasiewicz *et al.*, 2011b; Waters *et al.*, 2014; Maslin & Lewis, 2015). These debates highlight the tension and divergences within NS and in particular within Geology regarding the proposal of the Anthropocene as a new interval in the GTS. This dissensus was highlighted by one NS interviewee as follows, *“there is not even a geological opinion, there is a pretty strong divergence of opinions within the geological sciences”* (R3). As previously outlined, one of the key criteria in order to ratify the Anthropocene as a geological epoch is to find a clear, global and synchronous marker. To this regard, one NS interviewee argued that the changes on which this marker can be recognised are neither neat nor tidy or abrupt; rather a set of interconnected changes, more like a complicated transition on which geologists have to make a pragmatic choice which do not necessarily *“point or reflecting the critical driver or some critical action”* (R5).

All NS interviewees argued that the definition of the Anthropocene’s onset has to be taken independently of the debates that are taking place within social science and humanities: *“It is true that the Anthropocene is being used in social and political debates, among others, but we can’t let those debates influence a choice of a boundary”* (R5).

The evidence that we are looking at, it would be just as important if any other cause other than humans had caused it. It so happens that, humans and their collective behaviour, their social behaviour are causing them. [Geologist are trying to] show that there is a rational empirical basis for saying that things have changed without making any explicit or specific links to the social behaviour or the political implications any more than we have to [...]. (R4)

Interestingly, the same interviewee argued that because human behaviour is the driver of the changes represented by the Anthropocene, *“we have to try to understand the link between the human activities and the geological effects”* (R5). Arguably, such understanding would draw on social science epistemology; nonetheless, this interviewee noted that this link should be understood *“in the same way as you have to understand the dynamics of a meteorite or the behaviour of volcanoes”* (R5). The inevitable question then becomes, is that possible? To this regard, an interviewee mentioned that:

Human changes are more complex than the average meteorite or the average volcano, and so we as geologist are not qualified at all to analyse or deal with changes to human social or political or cultural or economic systems, and so forth. And in terms of trying to understand the Anthropocene phenomenon, there’s clearly not just space but also a need to have this kind of multidisciplinary approach. (R4)

Due to the fact that any possible stratigraphic onset for the Anthropocene is notably close to the present time in terms of geological timescale, it is practically impossible to detach its definition from the political implications derived from the different possible choices. The proposal of the Anthropocene as a new geological epoch has taken geological science to a political context they have never experienced before. This situation was highlighted by two interviewees as follows:

The geologists who find the oil, find the gas, find all the natural resources, dig it up but have no responsibility because they are just scientist finding where the resources are, have suddenly been thrown into the lion's den and go 'ok guys, you want to define when humans have become a geological superpower' that's political! And actually, they are dealing with it incredibly badly. (R6)

To only look at the past is a very rooted idea in geology, and the past has never given us trouble. The vertigo many people feel with the Anthropocene is that it is questioning us for today's geology, and that implies asking ourselves what are we doing with the planet? Why are we releasing radioactive isotopes? Why are we releasing plastics and pollutants? (R2)

It has become manifest that geologists are struggling to maintain the 'objectivity' that gives scientific validity to their practice, trying to look at the causes of the Anthropocene as objectively as they can, which is very complicated to do, as one respondent mentioned when discussing defining the Anthropocene *"the analysts (humans) are self-analyzing and drawing conclusions about themselves and interpreting the self-relevance of their data"* (R7). This tricky situation was defined by one of the SS interviewees as a "catch 22" type of situation that might represent *"an existential challenge for the discipline"* (M4). As one of the NS respondents argued, *"we are trying to be as objective as one can be"* (R5); the unavoidable question then is, to what extent NS can "objectively" define the Anthropocene? It is apparent that the Anthropocene is underpinning the old claim that science is not a dispassionate discipline that produces incontrovertible facts. As was suggested by Latour (2014), "Remember this idea that social sciences could never be really scientific because the researchers were too much involved with their subject matter? Well, the great thing about living in the Anthropocene is that this is common to pretty much everybody" (ibid: 139AAA11). The enactment of the Anthropocene as a geological epoch faces, on one hand, the common critiques and deconstruction of scientific objectivity made from the social sciences and humanities. At the same time, because the Anthropocene is deeply entangled with *what it means to be human*, as reviewed in chapter 2 (Chakrabarty, 2009; Yusoff, 2016; Johnson & Morehouse, 2014), is manifested that it is practically impossible to enact the Anthropocene as 'only' a geological epoch. As stated by Swyngedouw (2015) and Baskin (2015), the Anthropocene means that all that is now said about the world has also to consider its social,

political, economic and cultural world. To this regard, it is worth noting that one interviewee pointed out that the Anthropocene might change the way geology is being practiced:

[The Anthropocene] is a great opportunity to seek for new paths in the geological analysis. It certainly complicates our usual way to work, we are so comfortable with our rules and our usual methodology, but I think it is a fascinating intellectual challenge, I welcome the complexity it brings, because in a way we had the geology too fossilised, and this is a way to de-fossilise it. For the first time in the history of geology as a science, we are debating about something that can be enriched with the contributions of other means that are not the geological ones. (R2)

Whereas all SS and EA respondents recognised the Anthropocene in geological terms as a proposal of a new epoch, none of them delved into the topic, overall arguing that it is a matter of concern for NS and for Geology in particular, and not something relevant for the way they see and use the concept of the Anthropocene. The following quotes are representative of these claims:

“I’m not the person to tell you when the Anthropocene actually happens. I mean in environmental humanities the way in which this concept has been taken up is more as a philosophical intervention” (M2)

[The geological onset of the Anthropocene] matters if you are a geologist and you want the Anthropocene to conform to the epistemic conventions of stratigraphy, it matters, I guess to the status of their discipline and the epistemic practices of their discipline. They want to be able to drive their golden spike in to the ground somewhere. (M5)

“Our impact is large already across the world. If a bunch of geologists come and call it the Anthropocene, well fine, they’re 30 years late, or 50 years later” (W2).

Overall, the enactment of the Anthropocene as a geological epoch was largely conveyed by NS interviewees, whilst SS and EA respondents somehow distanced themselves from this particular enactment.

4.2 The academic event

The Anthropocene was enacted as an academic event, mostly by SS, who broadly described it as an opportunity to revisit old debates that problematized the separation between nature and culture and the idea that “the human rational subject can separate itself from its natural context” (M2).

Most respondents argued that the Anthropocene underpins previous claims that suggest there is not, and there has never been, either a division between nature and humanity or a pristine nature untouched by humans. The Anthropocene, enacted as an academic event, was also considered as an entry point to

foster dialogues among scholars who probably never before had a common topic to debate on. This interest matched the claims reviewed in the literature about the necessity to bring different disciplines into conversations about the Anthropocene (Malm & Hornborg, 2014; Palsson *et al.*, 2013; Sörlin, 2012; Latour, 2015; Castree, 2015; Swanson, 2016; Brondizio *et al.*, 2016; Bai *et al.*, 2016). The relevance of the Anthropocene to foster dialogues across a wide range of disciplines was stated by one interviewee by saying that the Anthropocene might be the “*next biggest sort of interesting thing since writing culture, in terms of a big shift*” (M3). This enactment of the Anthropocene as an academic event was greatly conveyed as an ongoing dialogue and discussion within a wide range of different projects across many disciplines. One interviewee pointed out that SS scholars are using and making sense of the Anthropocene concept “*how they see fit, based on the pre-sets and epistemologies of their own discipline*” (M4). To this regard, it is worth noting that many SS interviewees argued that there is more than one Anthropocene (M2, M3, M7), which matches

the premise on which this research takes place; the Anthropocene concept does not have a fixed ontology and, conversely, its reality is constantly being done and *enacted* in multiple ways.

SS respondents pointed out that the choice of a starting point would tell a different narrative about humanity’s endeavours, a claim that is similar to that which has been reviewed in chapter 2 (Bonneuil, 2015; Rose *et al.*, 2012). However, overall, the SS interviewees argued not to be worried about the definition of a geological starting point, that it wouldn’t close down the debates around the Anthropocene. Clearly, they will keep questioning, deconstructing and debating around what natural scientists do and how they do it. To this point, it is worth noting that two SS interviewees called attention to the composition of the NS scholarship who are debating the Anthropocene as a potential geological epoch describing it as:

[a] fairly interdisciplinary collection of individuals, but by no means the ideal in terms of epistemic diversity you might hope, if you were assembling a working group to decide on all the bigger issues the Anthropocene has come to name. (M5)

The other interviewee pointed to the few SS scholars collaborating in the scholarly agenda of ESS modelling, from where the Anthropocene arose and where humanity was only considered as an aggregated dimension. A situation which, according to the interviewee, reflects questions of inequity, power symmetries, geographical difference and intersectionality that are obscured by the Anthropocene (M2). Interestingly, one NS respondent likewise argued that “*the AWG doesn’t represent geology, it represents a working group*

within the geological sciences community and not everybody could join if wanted to join” (R3).

The aforementioned claims regarding the composition of the ESS and Geology scholarship, from where the Anthropocene arose and where it is now being discussed respectively, is a topic that was not identified during the literature review, most likely because, as argued by M2 in this paragraph, the publications on the Anthropocene implications are overwhelming the discussion of the academic scholarship where it was coined. At the same time, not all interviewees enacted the Anthropocene as an academic event in the same way. The following quote presents the sole enactment of the Anthropocene as a mean to get funds for research:

You are going to see the same old debates again and again. But it's just a new vehicle, a different vehicle. It'll keep us all employed, will take lots of money off governments to do lots of research projects about this, will do lots of new thinking and conferences to engage ourselves and make us feel important, will try and encourage other actors to engage with the concept - NGOs, politicians, newspapers - then we'll moan about how those other actors have misused the concept or deployed it for problematic political ends, so then we'll proliferate with another critique of the concept. So that's the basic way, the cynical way of seeing what the Anthropocene will do. The really interesting or important question is 'does it politically enable you to do things better?' (M7)

Whether the Anthropocene will turn out to be a concept comparable with ‘culture’, or rather a vehicle to keep SS scholars employed and make them feel important, so far it is serving as an opportunity to “re-think debates around green political theory, ecological democratization and ecological citizenship, amongst others that seemed to ran out of steam” (M2), that can now be revisited under the

holistic umbrella of the Anthropocene. These debates, however, are at risk of not taking place if the Anthropocene is framed as an emergency because its understanding might require multidisciplinary work and time, and also the development of new knowledge practices.

4.3 The ideological turn

For most interviewees, the Anthropocene is an awareness of the humankind’s disruption on the planet, thanks to the concept’s nature as a framing encompassing the different impacts of the human activities and the environmental problems that derive from them. It is worth noting that almost all respondents called attention to ‘human behaviour’ as the cause of these disruptions, as highlighted by one NS interviewee:

Recognizing evidence of our social behavior (pollution, resource exhaustion, degradation of Earth system processes, etc.,) is perhaps the most important contribution that the scientific community can offer humanity. Anthropocene give us a chance to recognize our ability to disturb natural systems. (R7)

Some interviewees argued that the Anthropocene as an awareness of the consequences of certain human behaviours and practices may lead us to question and reflect on how are we living and managing our individual and collective affairs. In this regard, one interviewee called attention to a need for completely new governance structures to govern people's impacts:

We now know that with our growing populations and appetite for resources we are having a huge footprint on the planet, we need new governance structures we need to revise things like the WB, the IMF, the WTO, we need to rethink the UN and I also think that we need to go back and question neoliberalism, [...] we need to move to a more inclusive society. [...] Because we can plan and we can predict, we can actually manage this system for better or for worse. (R6)

In a different way, one EA respondent suggested that the Anthropocene will make people realise humans need nature to thrive (W1) and that “*any kind of sensible economic development model going forward has to be all about protecting the natural capital of the planet*” (ibid). This interviewee argued that if people gain sufficient appreciation of the degree of control, we have got over the

key planetary systems and the threats of not using it properly, then it is possible to “*chart a sustainable course through the Anthropocene by managing the planet in a more sensible way*” (W1). This ideological enactment of the Anthropocene that present humans as managers of the Earth system, is similar to that of Crutzen & Schwägerl (2011) reviewed in chapter 2. The recognition that humans need for nature as ‘capital’ is politically and ethically sensitive, in the sense that it could also be used to foster technological interventions that instead of being a way out of the environmental problems represented by the Anthropocene, could be a way to maintain and even foster the structures that caused these environmental problems, as reviewed in chapter 2 (Werner cited by Hamilton, 2015). In this regard, one EA interviewee mentioned that a “Mark Lynas type” of environmentalist could use the Anthropocene to foster geoengineering deployments “*because they can’t envisage moving off fossil fuels*” (W2). Likewise, a NS respondent argued that

We have no idea how to truly apply stewardship over Earth resources. [The Anthropocene] has been borrowed by doubters and denialist to outline an illusion of the greatness of humanity. [...] I perceive humans more as tinkerers, messing with the system without knowing what the tinkering may actually do in the long run. (R7)

It is worth noting that while all respondents highlighted the influence of human activity on the Earth system as the cause of the Anthropocene, none described it as a crisis, and one interviewee argued it should not be taken as such, “*the Anthropocene is not a crisis. It means a complete change of things from the past but it says that happened in the past but is not about what happens right now*” (R3). Unsurprisingly,

Geology does not define crises but time intervals, being clearly different. The geological understanding of the Anthropocene is evidently not comparable to other understandings of the concept, which nonetheless emerge from the fact that the causal agent of this suggested geological epoch is mankind.

It is worth noting that two SS interviewees argued that EA are so attached to the idea of a pristine nature that it would create large political damage for them to give up on that idea (M5). Nonetheless, none of the EA interviewees claimed that the concept of a pristine nature was indispensable for their purposes, and one of the interviewees stated that in fact there was never a pristine nature to protect:

[The Anthropocene] is a re-packaging of the old wilderness versus management approach and that always had its weakness in a sense that there really was not any wilderness, it always had a strong romantic element. (W3)

Most interviewees stated that the Anthropocene might be the fatal blow to the idea of nature as separated from humans, an argument that was reviewed in chapter 2 (Swyngedouw, 2011; Lorimer, 2012; Haraway, 2016; Latour, 2015). Nonetheless, one interviewee noted that, in the Anthropocene, the concept of nature will necessarily include humans and as such there will be plenty of human natures (M7).

Overall, two ideological *enactments* of the Anthropocene were identified. One can be largely defined as a “managerial” ideology that attempts to deploy technological interventions to gain more influence on the Earth system, mostly for utilitarian purposes.

This ideology is akin to what was stated by Crutzen & Schwägerl (2011), and highlighted by Malm & Hornborg (2014). The other ideological enactment can be outlined as “reflexive”, which considers the Anthropocene as a moment to question the current economic, social and political institutions and in general the human ‘collective behaviours’ that have led the planet to the Anthropocene, which is akin to what was reviewed in chapter 2, by Braje & Erlandson (2013). It is recognizable that the ideological enactment of the Anthropocene confronts opposed ideas about the definition of the world, as stated by Latour (2015). It became apparent that the Anthropocene is a concept that can be crafted in different ways to enact different ideological shifts, and this is probably, in part, due to the broad range of phenomena it encompasses.

4.4 The Anthropos of the Anthropocene.

During the analysis process, the interviewees' answers to the question of who is to be understood as the alleged causal agents of the Anthropocene proved to be relevant to identify the multiple versions of the Anthropocene enacted by the respondents. At first glance, the name 'Anthropocene' leads us to think it is clearly pointing to a causal agent; nonetheless, when questioned about who is considered the *Anthropos* of the Anthropocene, and what would be the relevance of identifying them, the interviewees gave different answers. Whereas one respondent acknowledged that *"to be honest, I am not too bothered about that. It is going to be interpreted in different ways and that doesn't matter too much"* (M1); other interviewees considered that the universalization of humanity as the causal agent of the Anthropocene is *"very ingenious and apolitical"* (M2), and *"a very problematic conception"* (M4). Although M4 also pointed out that, when looking at the geological scale, it is practically impossible to differentiate between groups of humans. Another interviewee

claimed that *"the question of whether it's all humans or not is important in terms of what your political goal is"* (M7). Whereas one more suggested that the '*Anthropos*' of the Anthropocene can be interpreted in many ways, just like the '*Anthropos*' of Anthropology, and the tension derived from that can be acknowledged and held, *"we can hold the tension and not freak out when we talk about the 'Anthropos' of the Anthropocene"* (M3). Finally, one interviewee questioned whether SS were being over critical of the term:

Talking in terms of Anthropos, is a lexicon that is familiar to geologists, and maybe we are too critical of it and it is just a vernacular they use, rather than some sort of conspiracy to mask the causation. But if we let the geologist decide then we would probably have to use the category that they give us which might not be that desirable from a social science perspective. (M5)

It became clear that not all SS are concerned with the question of who are the *Anthropos* that caused the Anthropocene. Most of them noted that alternative labels such as *Capitalocene* or *Anglocene*, are only of interest to particular groups of scholars and therefore cannot foster the same kind and range of debates the Anthropocene is doing.

Among the NS interviewees, most identified a group of humans that could be considered to have exerted the most influence on the Earth system leading humanity to the Anthropocene: *"the humans who have unleashed most energy"* (R4), *"white rich males from the 'Anglo' sphere of influence"* (R6), *"British and American success at imperialism"* (R7), and *"The West"* (R1). Most of the NS respondents argued that for the purposes of assessing the Anthropocene as a geological epoch, there isn't any advantages in particula-

rising the causal agent beyond humanity as a whole. Regarding the alternative labels of Capitalocene, one interviewee mentioned that terms like that cannot be considered in geological terms “because capitalism is not going to fossilise” (R2). Nonetheless, another interviewee argued that,

Terms like the Capitalocene are very important because what they do is they counterpoint, so they put up a mirror to the Anthropocene and go: oh, hang on, why are we here, why do we have an Anthropocene? What would happen to the Anthropocene? (R6)

Conversely, all EA respondents mentioned that different groups of humans have different impacts on the Earth, and as one interviewee argued “a large proportion of society would rightly say ‘Hang on we didn’t test nuclear bombs, we’ve burnt virtually no fossil fuels” (W2). To debate about alleged culprits or differentiated responsibilities was considered to be “not the point” (W1), but also a waste of time, as claimed by another interviewee:

If we start blaming each other then we actually don’t get on with dealing with it, so to that extent I actually find it a hindrance to start playing what is essentially a form of politics when you are faced with an actual issue where you have to get off your ass and do something.(W3)

In general, whilst most respondents across the three study groups recognised that it is possible to identify particular groups among humanity that have exerted the largest influence on the Earth system, most respondents argued that it is not relevant to the attempts to define the Anthropocene to point out a particular group of humans as the causal agents/responsible for the Anthropocene. Whilst it is true

that it is complicated to define a group of humans as those who have caused the Anthropocene, it is basically useless in geological terms. It is also true that to consider humans as a whole to be the causal agents of the Anthropocene, presents the danger of masking the socio-economical inequalities that prevail in most societies. As difficult as it is, I consider that SS and EA shall advocate for highlighting the different magnitudes of impact on the planet that different groups of humans have, largely due to their living styles; on these differences lies the political leverage of the Anthropocene to call into question the consumerist and predatory modus vivendi of some societies, which is basically incompatible with the finitude of the Earth system.

5. Conclusion

The aim of this dissertation was to explore the multiple ways in which the Anthropocene concept is being *theoretically enacted* by members of three particular groups: social scientist, natural scientist and environmental activists. The research drew on two premises framed in Annemarie Mol's (1999, 2002) concept of ontological politics:

- The concept of the 'Anthropocene' does not have a *fixed* ontology.
- Multiple versions of its reality are being *enacted* and done *theoretically* by natural and social science scholars, and as well by environmental activists. And these multiple ontologies clash and coincide in different aspects.

The most important findings of this research are that the Anthropocene concept is being *enacted*, and understood in more than one version. Different ontologies of the Anthropocene are being *enacted* within the social sciences, the natural sciences and environmental activism.

Overall, each study group *enacted* a particular version of the Anthropocene: SS largely *enacted* it as an academic event, NS as a geological epoch and EA as an ideological shift. It became clear that the Anthropocene is able to serve as an entry point to bring these three groups into conversation under its holistic umbrella.

The Anthropocene concept calls for an integrative understanding of the Earth system, which implies that there are neither 'social only' nor 'natural only' stories. I think that rather than putting humans at the centre of the understanding of nature, the Anthropocene puts them everywhere, and therefore, to talk about humans is to talk about nature and vice versa. While the idea that humans and nature are deeply interwoven is not something new, the Anthropocene is making that relationship literally evident. To recognise the Anthropocene posits a challenge to both science and environmental activism to re-define its terms, the former by defining a human science and the latter by redefining the protection of a human nature, since the ideas of a pristine nature are denied by the Anthropocene.

Out of the three identified *enactments* of the Anthropocene, the geological epoch was the most complicated version to maintain due to the fact that the Anthropocene represents a large spectrum of phenomena of which humans are a key component. Therefore, it is practically impossible to delimit the Anthropocene as to be understood only as a new interval in the GTS. The enactment of the Anthro-

pocene as a geological epoch clashes with both the academic event and the ideological shift, where the Anthropocene is understood in much wider terms. All three *enactments* coincided in arguing that humans are inextricably part of nature and at the same time, the impact of their activities has reached a significant influence on the Earth System.

The Anthropocene is an opportunity to realise, as Chakrabarty (2009) said, that human history is imbedded in the deep time of this planet, our lifetime is embedded in the rhythm of the Earth. If we fail to recognise that and act in consequence, future human generations may end up living in a radically different world, not precisely better. Perhaps finding themselves victims of their own *planetary force*. By exploring and fostering dialogues between the multiple ontologies of the Anthropocene, we might be able to question the ideological foundations of the human enterprise, and to imagine radically new and less disruptive ways to live and thrive. The challenge that lies ahead is to be able to build institutions required to democratically and responsibly regulate the human collective behaviour that is causing the Anthropocene. In this regard; I think we shall be cautious of framing the Anthropocene as the apotheosis of humans, and rather realise this planet is, so far, the only place where life as we know it is possible.

6. Bibliography

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