

Manuscript version: Author's Accepted Manuscript

The version presented in WRAP is the author's accepted manuscript and may differ from the published version or Version of Record.

Persistent WRAP URL:

<http://wrap.warwick.ac.uk/113095>

How to cite:

Please refer to published version for the most recent bibliographic citation information. If a published version is known of, the repository item page linked to above, will contain details on accessing it.

Copyright and reuse:

The Warwick Research Archive Portal (WRAP) makes this work by researchers of the University of Warwick available open access under the following conditions.

Copyright © and all moral rights to the version of the paper presented here belong to the individual author(s) and/or other copyright owners. To the extent reasonable and practicable the material made available in WRAP has been checked for eligibility before being made available.

Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge. Provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way.

Publisher's statement:

Please refer to the repository item page, publisher's statement section, for further information.

For more information, please contact the WRAP Team at: wrap@warwick.ac.uk.

On the dangers of an Anthropocene Epoch: Geological time, Political time, and Post-Human Politics

Keywords

Anthropocene, human, nature, epoch, time, temporality, subjectivity, post-human, non-human, geology, geological time, political ecology, modernity, periodization, history

Abstract

‘When’ is the Anthropocene and who are its subjects? This article explores the political stakes of the frameworks mobilised to answer this question at a pivotal moment when the dominant meaning and implications of the concept of the Anthropocene are still in flux. The article seeks to demonstrate the ways in which engaging with the question of the ‘who’ of the Anthropocene also entails assumptions about the ‘when’ which rely on a transposition of geological onto historical and political periodization. The idea of the Anthropocene as a new epoch, with the associated focus on appropriate starting dates, novelty, and periodization, raises difficulties for attempts to construct alternatives to the ecologically problematic temporal discourse of modernity, the subjects thereby produced, and the critical resources with which to engage these. The inscription of these temporal boundaries in the anthropocene debate provides a framework which limits attempts to engage with the mobility of the human/nature border and associated arguments for an expanded (in both spatial and species terms) political constituency through which to engage the ecological challenges of the anthropocene. Such a framework obscures the ways in which the non-human is already integral to dominant political conceptual structures and the article proposes that instead of a focus on whether the non-human can/should be brought into an Anthropocene politics, we need first to re-examine *how* it already is.

Introduction

The idea that we have entered a new geological epoch in which humanity is remaking the geological structure of the planet—the Anthropocene—has rapidly gained currency since its popularisation in a 2000 article by Paul Crutzen and Eugene Stoermer. The concept of ‘the Anthropocene’ is increasingly employed as a marker of novelty or a paradigm shift (Hamilton, 2015; Maslin and Lewis, 2015; Johnson and Morehouse, 2014) that animates demands for new perspectives on the problem of climate change, in media reporting (e.g. Macfarlane, 2016), popular science (e.g. Kolbert, 2014) and academic literature in the sciences (Bai et al, 2016; Steffen et al, 2011; Zalasiewicz et al, 2017) and social sciences and humanities (Burke et al, 2016; Clark, 2014). In this article I argue that contemporary attempts to harness the novelty of the Anthropocene as *geological* epoch to prompt a reconceptualisation of the *political* implications of the changing relationship between the human and natural that it describes are problematic. We need, I argue, to pause and re-examine the particular mapping of geological temporality onto political temporality in what is fast becoming a commonplace claim about the Anthropocene; that the world has entered a new geological epoch in which the human and natural can no longer be distinguished.

A number of scholars have characterised the Anthropocene in terms of a disjuncture between the human as geologically active but politically passive (e.g. Last, 2017; Swyngedouw, 2013), even in light of innovative, provocative and far reaching manifestos for political action on climate change (e.g. Burke et al, 2016). In response, a growing body of ‘critical Anthropocene’ research located at the intersection of Political Geography, International Relations, Security studies and Environmental Humanities to which this article contributes offers a focus on the production of subjectivities in the light of the human/nature destabilisation (Cudworth and Hobden, 2011; Fagan, 2017; Mitchell, 2014; Ruddick, 2015, 2017; Yusoff and Clark, 2017; Yusoff, 2013, 2014), insights into the political implications of different starting points for the Anthropocene (Harrington, 2016; Hamilton, 2014; Szerszynski, 2017) and associated critiques of the concept as anthropocentric, capital-centric, and universalising (e.g. Crist, 2013; Haraway, 2015; Yusoff, 2014). These approaches to subjectivity have led to a series of important calls for consideration of a larger political constituency when engaging with questions of political ecology; theorisation of interspecies relations (Youatt, 2014) of the non-human (Crist, 2013; Burke et al, 2016; Latour, 2015; Yusoff, 2013), and the posthuman (Fishel, 2017; McDonald, 2017; Rothe, 2017). They have also led to related calls for a broader or more complex spatial imaginary—a move to planetary, rather than local, national, or global spaces of political and ethical imagination (Burke et al, 2016: 504; Ruddick, 2017).

In responding to these important calls however, I argue that invoking the Anthropocene leads to an additional layer of complexity because its temporal delineation makes it difficult to think expansively about subjectivity or space. Despite a growing body of critical work on Anthropocene subjectivities and geographies, there is relatively little on the effects of its use as a temporal marker. Questions addressing the ‘when’ of the Anthropocene are framed in terms of when and if it has started (Lewis and Maslin, 2015; Steffen et al, 2015; Zalasiewicz et al, 2015; Hamilton, 2015; Oldfield, 2015) and the politics of particular starting points (Harrington, 2016; Lewis and Maslin, 2015; Yusoff, 2013; Chakrabarty, 2009). However, in considering the implications of adopting any one particular starting date for the production of subjectivities the related question of the effects of starting dates themselves is somewhat neglected. The link between how we conceptualise the question of ‘when’ (through the

framework of starting points, periodization, historical, deep or geological time) and the subjects and spaces this produces is currently under-theorised. In response, this article explores the way in which the Anthropocene's embeddness in geological accounts of temporality contributes to the limits in political imagination and action identified above.

My approach starts from the idea that times are worlds; that different temporalities are distinct worlds (Nancy, 1997; Agamben, 2004). I treat claims about times as claims about worlds in order to interrogate the danger that the Anthropocene concept, for all its critical potential, also reproduces a discourse of linear time in which, through the meshing of geological and historical accounts of temporality, it is treated as marking a stage in 'progression' or 'succession'. I argue that the temporal delineation of the Anthropocene epoch entails a mapping of the world-historical present which relies on and reproduces exclusionary accounts of the human in determining what is proper to politics. It does this through a reliance on a linear account of time which obscures plural pasts and renders plural presents anachronistic. The dominant mobilization of the Anthropocene thus contributes to a socio-spatial displacement of problematic processes and by-products of contemporary Western postindustrial societies, compounds this by obscuring the histories that would make them visible, and excludes from politics the people they rely upon and affect (Jackson, 2013; Mirzoeff, 2018; Povinelli, 2016; Whyte, 2018).

The first part of the article seeks to demonstrate the ways in which engaging with the question of the 'who' of the Anthropocene also entails, and sometimes obscures, a series of assumptions and boundary devices around the 'when' which rely on historical thinking and periodization. I first outline some of the complexities that arise in approaching the politics of the Anthropocene primarily in terms of its displacement of the human/nature distinction and associated argument for an expanded (in both spatial and species terms) political constituency. I suggest that such a focus obscures the ways in which the non-human is already integral to dominant political conceptual structures and that instead of a focus on whether the non-human can/should be brought into an Anthropocene politics, we need first to re-examine *how* it already is.

I then show how current mobilisations of the concept of the Anthropocene limit such a reconceptualization of how we might engage with the non-human through reproducing and relying on a series of temporal assumptions about human and natural time which in turn reproduce a modern political subject. I trace this production through the current debate on potential starting dates for the Anthropocene, which is the dominant way in which questions of time are currently engaged in Anthropocene work. I then explore what is at stake in the specific kinds of temporal thinking identified, through a focus on the themes of novelty, periodization, and epochalisation and the relationship between geological and historical time. The article concludes with a suggestion that rather than seeking to expand our conceptual categories beyond the human there is scope to turn the geological timescales opened up by the Anthropocene concept inwards to engage with the plural pasts of that human and reconfigure its contemporary constitutions, and in so doing to destabilise the temporal structures by which dominant accounts of the political subject are bound.

The Politics of the Non-Human

The dominant way in which the implications of the Anthropocene have been understood in critical interdisciplinary literature on the Anthropocene as produced by scholars working at intersections of Political Geography, International Relations (IR) and critical social and

political thought is through the challenge that it poses to the human/nature binary (see for example Dalby, 2017; Harrington, 2016; Lövbrand et al, 2015; Wakefield, 2014; Burke et al, 2016) and the politics of modernity reliant on this binary (e.g. Johnson and Morehouse, 2014).

Such approaches tend to suggest that to conceive of the environment or of ecological problems in terms of the natural is problematic and that instead a focus is needed on the complex entanglements of the human and non-human which make them ‘indistinguishable’ (Burke et al, 2016: 510; Harrington, 2016). That is, what is required is to stop thinking about the world in terms of a ‘natural’ backdrop to human activity, which it has, in any case, never been (Dalby, 2017). The human needs to be understood instead as part of a complex ecological web of the natural and social (Cudworth and Hobden, 2011; Burke et al, 2016) in which, as Harrington (2016: 490) argues ‘everything is simultaneously human and natural’. The Anthropocene thereby ruptures, on this account, the human/nature binary and means that ‘the concepts of self and other fade away’ (Harrington, 2016: 490).

However, to rethink the relation between human and natural, as any conceptualisation of politics in the Anthropocene seems to demand, is a very difficult task. It requires an account of how the human and natural remain distinct and yet are related in a non-oppositional, non-hierarchical way and in so doing encounters a series of problems. In particular, the framing of the Anthropocene in terms of the history of human changes to the planet, of the human expanding outwards to impact nature, naturalises and extends outwards a liberal humanist framework (Jackson 2013: 682). In doing so it shifts attention away from how that natural is (also) within the human and the need for a refocusing on what is internal to the subject of humanism thereby entailed.

The first risk is that the human becomes naturalised. To say that the human is not ‘outside nature’, but ‘within and part of’ the earth system (Maslin and Lewis, 2015: 114), a ‘force of nature’ (Hamilton, 2015: 103), part of the geological strata previously considered only as the backdrop for human politics, is a move which attempts to displace anthropocentrism. However, in doing so it potentially depoliticises the human and obscures the way in which the very constitution of the idea of ‘human’ has relied upon and reproduced (some) humans as naturalised. The idea of ‘nature’ (and therefore of ‘human’) itself is not innocent, but entangled with discourses of race, extinction and geology emerging in the 18th century in which black life was treated as a form of animal life (Mirzoeff, 2018); classing (some) humans as a ‘part of nature’ is nothing new.

As Giorgio Agamben (2004) has argued, to think in terms of ‘man’ becoming natural, or animal, has tended to entail a parallel discourse of having reached the end of history.¹ In turn, Agamben argues, this discourse entails that there is ‘nothing left but depoliticisation of human societies by ... the taking on of bare life itself as the supreme political (or rather impolitical) task’ (2004: 76). That is, natural life itself and its management is considered ‘man’s’ last ‘historical task’ and as such is depoliticised - it is ‘without inheritance’ (Agamben, 2004: 77). Such an animalisation of the human was for Agamben (2004) fundamental to the totalitarianisms of the twentieth century and its resonance is particularly stark when paired with the framing of the Anthropocene in the apocalyptic terms of the earth’s sixth great extinction event (Barnosky et al., 2011).

¹ I follow Agamben’s use of ‘man’ here to indicate not a neutral/universal humanity but a specific constitution of modern subjectivity.

In turn, the animalisation of the human changes the political realm such that the political becomes concerned precisely with this animalisation - with the *zoē* that is shared between human and animal - and its management (see Shukin, 2009; Wolfe, 2012; Vaughan-Williams, 2015). The 'natural' becomes the subject of (bio)politics² To simply insist that the nonhuman needs to be heard in politics then obscures the ways in which, on this reading, modern politics is already engaged in the management of the natural/animal, that is, it ignores the *constitutive* role of the exclusion of nature and the nonhuman (Ruddick, 2015: 1121).

Biopolitics structures the interaction of and distinction between human and nature in a very particular way and if this biopolitics *is* our politics then seeking to 'hear' the natural/animal within it is a difficult task. The discourse of granting 'rights' or 'sovereignty' to nature or animals then runs the risk of bringing those categories more explicitly within the biopolitical structures of which they are already a part.³ In focusing once again on an unexamined 'human' and its outside, it also fails to recognise the limitations and exclusions integral to the concept of the human. As Jackson (2013: 678) has argued, it is not enough to 'bring animals in', because black is devalued beyond animal; casting the animal as the opposable limit of the human draws on a discourse of species shaped by a discourse of race (see also Wynter, 2003).

The natural then is already established within our current political structures. Rosi Braidotti's (2013) account of the posthuman and the animal demonstrates how they already share spaces, roles and marginalisations; advanced capitalism does not rely on anthropocentrism, but in fact contributes to its displacement by marketing and profiting from the biogenetic structures of (especially animal) life itself (Braidotti, 2013: 76). Wakefield (2014) extends this argument beyond animalisation and a focus on *zoē* to demonstrate the ways in which the *inhuman* is incorporated into discourses of resilience. Naturalising the human as either biological or geological both potentially play into historical narratives about the 'end of man' and thereby obscure the very specific reproductions of the subject that are taking place in so doing.

This leads to the second risk that Anthropocene-inflected rethinkings of the human/nature relationship encounter; that human and nature become produced as indistinguishable. 'Post-natural' approaches turn their focus to destabilising the 'modern' account of nature as a 'pure, singular, and stable' domain (Lorimer, 2012 in Lövbrand et al, 2015: 215) through demonstrating the cultural construction of the category of nature, and in turn of the human. The difficulty here is that modern politics, and the production of the modern subject, is *already* constructed as a response to the instability and constructed nature of the distinction between the human and natural; the modern account of nature is the solution to a prior modern construction of the indistinction between human and natural as a problem.

To escape such a narrative and reframe the interrelation of the human and natural is then a difficult task, and much more than a claim that all life is part of a complex ecosystem and can

² Clark and Yusoff (2017) argue that there is reason to be cautious about a biopolitical approach to analysis of the Anthropocene because it fails to take into account the geological reframing of 'nature'. The biopolitical focus on the life/death interface does not necessarily illuminate the politics of the life/non-life interface (Povinelli, 2016). However, for the purposes of the argument being made here there are some shared features of a biopolitical and a geontopolitical analysis that are important, in that they both highlight the politics of the mobile borders of the modern human subject and the difficulty in thinking outside these.

³ It should be noted that many instances of attempts to grant rights to nature are strategic interventions designed to reflect Indigenous world views, which means that they also contain potential for destabilising biopolitical structures. See e.g. Povinelli, 2016. I am grateful to an anonymous reviewer for raising this point.

no longer be separated out. Because of course it could never be easily separated out; attempts to categorise and distinguish the human and natural have always been political cuts which simultaneously produce the human and natural. To say that everything is both human and natural is precisely the ground on which Agamben's anthropological machine operates; acknowledging exactly this, and in response drawing a limit within the figure of the human to contain those simultaneous identities; 'The division of life into vegetal and relational, organic and animal, animal and human, therefore passes first of all as a mobile border within living man ... it is possible to oppose man to other living things ... only because something like an animal life has already been separated within man.' (Agamben, 2004:15).

It is not, then, that the concepts of self and other fade away (Harrington, 2016) and 'subject/object distinctions break down' (Lövbrand et al, 2015: 213) if we follow through the argument that the Anthropocene requires us to conceptualise everything as simultaneously human and natural, rather than such an approach to the human and natural is what makes the inscription of self and other possible. The simultaneity of the human and natural is, on Agamben's account, not a neutral combination but rather one whose acknowledgement leads to the necessity for the inscription of a hierarchical boundary between them. The modern subject is already produced as simultaneously human and natural, and this has not been a progressive move, either for those classed as human or nature.

If we do not want to do away with the categories of human/nature and develop a flat ontology which either humanises nature or naturalises the human (as above), then as Corry (2017) argues, one alternative is to retain an analytical distinction between the human and natural whilst acknowledging that the contents of both categories can change. I seek in the following sections to trace the mobility of this distinction, not at the outer edges of the human but, as Agamben (2004: 92) calls for, within it: 'To render inoperative the machine that governs our conception of man will therefore mean no longer to seek new – more effective or more authentic – articulations, but rather to show the central emptiness, the hiatus that – within man – separates man and animal'.

So, whilst bringing into focus the problematic nature of the separation of the human and natural is important in trying to conceptualise the world of the Anthropocene, it also risks being co-opted into already-existing frameworks that rely precisely on the indistinction between human and natural. To say that what is 'new' is (a recognition of the fact that) that there is no pure nature (anymore) ignores the argument that the indistinction, and corresponding production of distinction, between nature/culture has been characteristic of Western politics and its practices of racial distinction, colonisation and exclusion (Agamben, 2005; Mirzoeff, 2016; Ruddick, 2015; Youatt, 2014).

Rafi Youatt (2014) has responded to this challenge by putting forward an argument that because politics has always relied on the concepts of nature and animal it should not be conceived as a human activity. This means that the Anthropocene demands not just rethinking participants in politics but rethinking the nature of politics itself. Seeking to offer recognition or welcome to nonlife entities within 'our' dominant political structures maintains that politics as a human activity and, as Povinelli (2017: 180) argues, 'forecloses the possibility of them [nonlife entities] provincializing us'.

If we accept that the natural has always been part of 'our' politics, and that such a positioning has domesticated the disruptive potential of that 'natural', then a shift of emphasis is required when thinking about bringing other voices and actors into politics. The problem becomes not

one of *whether* the natural is part of our political landscape, but *how*. To change that ‘how’ is, I think, a much more difficult task than the simpler one of addition. To respond to imperatives to think through how other voices might be engaged (as in Youatt, 2014; Burke et al, 2016) requires, among other things, an exploration of the temporal structures within which current sedimentations of the mobile border between human and nonhuman operate.

Moreover, if the task at hand is to rethink our political categories then this also requires revisiting the temporal frameworks on which they rest. Dominant political categories and concepts are reliant on and reproduce a peculiarly modern temporality. Concepts such as sovereignty and rights rely on particular temporalisations (Hutchings, 2008; Davis, 2008), and concepts of species, the human and the natural rely on particular colonial histories (Mirzoeff, 2018; Wynter, 2003); to rethink political categories thus requires an interrogation of temporal categories.

The concept of the Anthropocene seems to demand a particular historical consciousness in order to demarcate it and assess its significance. As I will elaborate below, it relies upon both geological and historical periodization, which Kathleen Davis (2008) has argued is central to the identification and diagnosis of our present times and to the political possibilities thereby legitimised. The dominant contexts in which it is mobilised as a call for action reproduce the human as active historical agent. It is difficult to mobilise the Anthropocene in the service of undoing the figure of the modern political subject because it is enmeshed and operationalized within a series of temporal and historical assumptions which continually reproduce that figure; as Constantin Fasolt (2004: 9) has argued, the modern subject is a product of the same act by which the past and present are distinguished. It is this difficulty that I go on to explore below.

The Politics of Dating the Anthropocene

The current reliance on the concept of the Anthropocene as a starting point for rethinking *how* the natural, animal, or nonhuman is brought into politics is both important and limiting. It is important that the effects of the Anthropocene on what we have considered natural time and natural conditions as the backdrop for human development are articulated. To treat the Anthropocene as ‘business as usual’ in climatic terms plays directly into the hands of ecomodernist arguments that we can manage change through more sophisticated technology or economic growth, that is, using the same techniques that have been deployed in the Holocene. As Clive Hamilton (2015) has pointed out, such responses rely on assumptions about, and experience of, the resilience of natural systems which is precisely the Holocene ‘environmental’ feature that the Anthropocene puts into question. However, employing the concept of the Anthropocene as a frame within which to rethink how nature or the nonhuman might be brought into politics is somewhat limiting because the Anthropocene concept itself tells a particular story about human time and natural time that places nature in a specific relation to human politics.

The discourse of the relationship between time and subjectivity in relation to the concept of the Anthropocene emerges on two different levels. The first is the specific debate about the appropriate starting date for the Anthropocene which I discuss below and the second is the broader reliance on the conceptual tools of starting points and epochalisation themselves which is the focus of the following section.

There are a number of current suggestions for dating the Anthropocene. Crutzen and Stoermer's (2000) formulation of the concept takes the industrial revolution as the turning point for anthropogenic effects on the earth's climate and this date, or a mid-20th century date of the great acceleration, remain, largely, the most popular views (Hamilton 2015; Chakrabarty, 2009; Steffen et al, 2015; Veland and Lynch, 2016; Waters et al, 2015). The current recommendation from the Anthropocene Working Group is 16 July 1945, the date of the first atomic bomb test (Ruddiman et al, 2018). There are however, as Autin and Holbrook (2012) have noted, other contenders; Ruddiman (in Autin and Holbrook, 2012: 60) suggests the advent of subsistence settlement, animal domestication and cultivation agriculture. Other approaches align the Anthropocene with the impact of fire, pre-industrial farming, colonization or sociometabolism (Lewis and Maslin, 2015).

However, as Veland and Lynch (2016: 2) point out, to delineate an Anthropocene epoch we need to find indicators 'that will span global spatial scales, and geologic timescales'. That is, as the Subcommission on Quaternary Stratigraphy (2017) (the body responsible for formally ratifying changes to the Geologic Time Scale) puts it 'it is a central precept in chronostratigraphy that the boundaries defined are always isochronous surfaces, i.e. they are the same time everywhere. In other words, all divisions begin and end at precisely the same point in time throughout the World'. Lewis and Maslin have argued that none of the starting dates put forward so far meets these criteria because they are not derived from a globally synchronous marker. They argue instead for the Orbis dip in 1610, a dip in CO₂ caused by the large decline in human numbers and the regeneration of forest due to the deaths of Indigenous people in the Americas as a result of colonization (Lewis and Maslin, 2015).

Different starting dates reflect assumptions about which humans and which social and political configurations are associated with the advent of the geological period in which we now find ourselves. A number of authors challenge the 'recent' dating of the Anthropocene, arguing that it is not the 'new' age of 'the human', but the continuation or mutation of longer histories of capital, patriarchy, racism or colonisation (Davis and Todd 2017; Mirzoeff, 2018; Moore, 2017; Haraway, 2015; Raworth, 2014, Verges, 2017). Kyle Whyte (2018: 771), for example, argues that Indigenous people have been living with what we might call the effects of the anthropocene—forced displacement, adaptation to new climates, new ecosystems, new plants and animals—for some time, leading him to claim that the Anthropocene is not a break with previous eras, but a 'continuation of practices of dispossession and genocide over the last five hundred years'.

Clearly, then, each of these temporal and material markers has implications for how we conceive of who is responsible for, who has historical agency in regard to, and what political solutions are available to address the challenges of the Anthropocene. Davis and Todd (2017: 763) have argued, for example, that the 1610 date not only foregrounds the responsibility of colonization for contemporary environmental crisis but in so doing reframes how we understand what that contemporary crisis *is*: as Sharpe (2016: 5) puts it 'transatlantic slavery was and is the disaster'. Such a dating, Davis and Todd (2017: 776) continue, means that we need to understand environmental crisis in terms of the 'severing of relations' through the brutality of colonialism combined with universalising imperialistic logic. In turn, political *solutions* entail 're-evaluating not just our energy use, but our modes of governance, ongoing racial injustice, and our understandings of ourselves as human' (Davis and Todd, 2017: 776).

This debate about starting dates points to a disjuncture within the Anthropocene concept. On the one hand, different starting dates indicate quite specific features of some human societies

as the important elements. On the other hand, the mobilisation of the Anthropocene concept and the mechanisms of geological dating through which it emerges necessitate species level and planetary claims.

On one level the turn to species thinking can be explained by a difference in cause/responsibility and effect, the argument being that while perhaps it has not been the human as species that has caused the Anthropocene, it is the human as species that it now threatens. However, many of these same authors have pointed out that the ways in which the effects of the Anthropocene are being/will be experienced are not evenly distributed among the human species. Moreover, as Chakrabarty (2009: 217) asks, 'If the industrial way of life was what got us into this crisis, then the question is, why think in terms of species, surely a category that belongs to a much longer history?'. His argument is that we need to think both in terms of the history of capital, and in terms of the importance of ecological interconnections and parameters for species existence which the Anthropocene brings into view (2009: 220).

But avoiding the pitfalls of universalising thought warned against by Chakrabarty and others is a particularly difficult path to tread in the case of conceptualising the Anthropocene. The very idea of the Anthropocene as a unified geologic stratum necessarily names humans as a collective (Yusoff, 2013) and that collective in turn takes on a specific colouration whereby the species is understood in terms determined by the Anthropocene start date. The threat of extinction posed by the Anthropocene, a seemingly paradigmatic example of a species-level effect regardless of cause or start date in fact posits a quite particular characterisation of that species. As Yusoff (2013: 783) argues, 'Implicit within the use of CO₂ as the material trace of the Anthropocene is the designation of a politicised stratigraphy composed through the event of carbon capitalism from the 1800s'; what is to be extinguished is therefore the subject of late capitalism.

It seems that the timescale of dominant Anthropocene starting dates (in Chakrabarty's argument, the timescale of capital) imposes itself on any attempt to consider species level timescales. This is a seeming tension between a geological history which focuses on synchronous planetary markers and species level effects, and a human history which seeks to disaggregate and determine the specifics of cause and effect. The challenge of the 'Anthropocene moment' (Szerszynski, 2017: 118) is to negotiate the relationship between these histories.

A number of commentators (Lövbrand et al, 2015; Maslin and Lewis, 2015) have argued that this negotiation can be resolved by the use of multiple definitions and interpretations of the Anthropocene. That is, Maslin and Lewis argue, the problems with universalism associated with the geological search for a golden spike and focus on starting dates do not have to impact on other disciplines. But it is difficult to see how the Anthropocene concept can be so easily divorced from its geological origins, and its association with claims about epochs and assumptions about time, history and subjectivity entailed therein.

Moreover, the dominant adoption of an Anthropocene start date related to the industrial revolution or atomic testing itself works to collapse histories of species and capital because both the ability to identify these specific events as historically important and the history of species seemingly offering a contending view draw on the same intellectual history and resources. Histories of species and histories of capital are not necessarily opposed to one another: the concepts emerged at the same time and are products of the same intellectual

resources (Mirzoeff, 2018; Wynter, 2003). Thinking in terms of histories and timescales of colonialism, on the other hand, potentially opens up a critique of the concept of species alongside a different articulation of starting points. That is, the relationship between species thinking and thinking in terms of human histories differs depending on the starting dates employed to discuss the Anthropocene; one tends to naturalise species thinking while another opens up a critique of it.

To return to the question of bringing nature or the non-human into politics, the current debate around appropriate starting dates for the Anthropocene then tends to reproduce a modern account of the human subject, and so, arguably, of human politics, which returns us to the difficulties outlined above in reconsidering the role of the non-human in that politics. However, my suggestion is that one cause of this difficulty runs deeper than the well documented universalization of particularistic accounts of the human that emerge as soon as any one starting date for the Anthropocene is proposed. It is also an effect of the way in which the very designation of the Anthropocene epoch reproduces a particularly modern temporality and, relatedly, the reproduction of a larger narrative which dissipates any tensions between human time and natural time, by relying on a familiar account of their interrelation. These are the issues I turn to in the following sections.

The Politics of Epochalisation: Historical and Geological

The question of what times we are in has implications, as indicated in the previous section, for deciding how we might best act in those times. However, the consideration of the historical meaning of the present that we can see in such attempts to ‘diagnose the times’ as an Anthropocene epoch also reproduces a modern understanding of history and temporality as can be seen in its reliance on themes of novelty, transition, acceleration, progression and periodization (Osborne, 1995; Kosselleck, 2004). In seeking to transpose debates about the geological epoch of the Anthropocene onto the social world a modern conceptual vocabulary is mobilised. In this section I argue that we need to critically reconsider starting points and epochalisation themselves because such conceptual structures invoke particular accounts of history and progress with particular consequences for rethinking the political subject of the Anthropocene.

While treating the Anthropocene as a new epoch might be relatively straightforward in geological terms, transposing this temporalisation onto the social world needs careful handling. Geological time is not a neutral container: as Szerszynski (2017: 115) points out, the geology of earth systems as established in the early 19th century is a product of the same modern episteme as the claims about political subjectivity that this new geological epoch is tasked with putting into question. To assume that adopting a geological timeline requires or prompts either a reconsideration of the modern subject and its politics, or the historical narratives upon which these rely, ignores the broader 19th century context of line-drawing practices that simultaneously enabled accounts of geology, history, race, colonization, and subjectivity (see e.g. Mirzoeff, 2018; Wynter, 2003). All rely on the same approach to time and history which allows for epochal claims to be made, and the particular mobilisation of geology in the discourse of the anthropocene does not escape these problems.

There are two interrelated implications of the Anthropocene debate’s embeddedness within modern temporal narratives for the consideration of other voices in Anthropocene politics; one temporal and one spatial. To address the temporal, I draw on Kimberley Hutchings’s account of the relationship between *chronos* and *kairos* in world political time to argue that in

conceptualising the Anthropocene as epoch, the modern human/nature dichotomy is reproduced in the temporal realm.

Hutchings draws on Agamben to demonstrate how the modern progressive account of temporality relies on two qualitatively specific conceptions of time working simultaneously (2008: 7). On the one hand, the narrative of periodization and progress relies on a *chronotic* conception of time as linear, universal and irreversible (Hutchings, 2008: 6); this is the geological time invoked in claims about the Anthropocene as ‘scalable, correlatable, measurable’ (Zalasiewicz et al, 2017: 97). On the other hand, this temporal account simultaneously relies on a *kairotic* understanding of time to produce distinctions between qualitatively different times in human history, which allows for conceiving of beginnings, endings, novelty, repetition, stasis and change (Hutchings, 2008: 6). This is the time of History, relied upon to make claims about epochal starting dates, in which certain times are more or less significant.

It is *kairotic* ordering which enables politics because it directs and grounds the relationship between the present and the future (Hutchings, 2008: 156) without which no political project could be conceived. In Western thought then, as Hutchings (2008: 156) shows, *chronos* is a threat to politics; the dominant Western account of politics assumes that it is about controlling and directing time as *chronos*. In order for there to be politics, for times to have meaning and direction, to be able to grasp that meaning and intervene in its trajectory, for the present to be understood as such, for plans, progress and visions of the future to be possible *chronos* must be given *kairotic* shape (Hutchings, 2008: 127). Politics, on this account is centrally concerned with shaping and controlling natural time rather than excluding it, hence the difficulties with ‘bringing nature into’ politics.

Kairotic temporality relies on and reproduces a vantage point of a singular present, or at least a singular significant present, because it is through an identification of that present and its meaning that historical significance can be retroactively assigned. A unitary history and a unitary present are integral to modern politics and provide the metric by which ‘the’ global present is differentially inhabited (see Chakrabarty, 2007); temporal plurality is obscured on this account. What Chakrabarty calls the parochial temporality of Europe, and Hutchings calls the globalisation of capitalism are positioned as the universal time of the present. Other temporalities might exist, but they are not politically or historically important; they do not drive the direction of world history as a whole (Hutchings, 2008: 159).

The problem here is twofold. Firstly, the Anthropocene claim that there is no natural anymore and the related argument that nature is now inserted into human politics and vice versa obscures the relationship between human and natural time which has been a defining characteristic of the modern assumptions claimed to have been the cause of the Anthropocene. There of course never was any ‘natural’, only cuts made in distinguishing the political from the nonpolitical through claims, in this instance, about temporality. To imagine that the human has shaped natural time is a modern position *par excellence*. To go further and try to imagine the human as now part of natural time seems more promising, until we see that the natural time relied upon in this move (the time of geological epochs) has already been given *kairotic* shape, and transposed into historical, and so political, time.

Secondly, as Fasolt (2004: xviii) has argued, historical evidence is distinguished by the assumption that a person is responsible for the traces that comprise such evidence—this is how we gain knowledge of the past. In making this assumption history determines what

counts as political, or to transpose into Hutchings's terms, what matters for diagnosing world political time. The centrality of an active responsible subject to the historical endeavour, the idea that 'someone must be responsible, and someone must be free' Fasolt argues, makes a politics of liberty, responsibility and progress seem natural, while others are ruled out as nonpolitical (2004: xviii). The mobilisation of the concept of the Anthropocene then, rather than offering geological time as an alternative or departure, in large part reinscribes geological time within an account of historical time which in turn naturalises the very politics which such mobilisations seek to critique.

The Production of Anachronism

The second implication of the Anthropocene epoch concept's indebtedness to modern temporal structures and the doubled account of (*chronotic* and *kairotic*) time therein is the (re)production of spatial anachronism produced by these structures. The modern account of historical time is one which is unitary and progressive; it is also one in which different times can (and must) exist at the same time (Koselleck, 2004: 2). Simultaneous historical 'nows' cannot be accommodated on the timeline of unidirectional progress, so those differences are rendered in terms of occupying an earlier position on the historical timeline. The chronologically synchronous, on the modern temporal account, does not map on to the historically synchronous.

Different places can experience different times, qualitatively speaking, at the same chronological time, but those times are directionally and progressively ordered through a *kairotic* account of temporality. This doubling is the modern solution to the problem of different levels of historical development occurring chronologically simultaneously (Davis, 2008: 133) and is what makes space mappable onto the *kairotic* timeline of development: hence the colonial gaze through which looking elsewhere (underdeveloped states) becomes looking backwards.

Place, time and political difference thus become inextricably linked in the modern imagination, and while claims about epochalisation and periodization in relation to the Anthropocene seem at first to be temporal claims, their political significance arguably emerges through the 'repressed spatial premises' (Osborne, 1995: 16) of the concept of modernity to which they are indebted. Looking elsewhere as looking backwards, on this reading, is not a move that neutrally maps differences in times. Such a directional and progressive account of temporality relies on what Bruno Latour (2015: 3) calls the modern 'arrow of time', which 'orients action in a highly specific way and gives to the future a very specific coloration of emancipation and to the past a sense of stagnant archaism'.

The implications of this for thinking about the Anthropocene are on one level fairly obvious: the claim that the now is the time of the Anthropocene is a claim about a specific now inhabited by a specific and small subset of the planet. Elsewhere is the past, and that past's future can only be 'our' now. It offers neither an alternative model nor a challenge to 'our' politics or characterisation of the now. Existing alternatives can only be seen as a precursor to our 'now'; they cannot offer alternative futures. Political difference, on this reading, is reframed as anachronism. This is the basis of the argument that the non-West should be partially exempt from emissions targets because they should be allowed to 'catch up', while the West leads the way in terms of what comes next in managing, reducing, or offering a geoengineering solution to those emissions. The implications of this structure of temporal

othering in retrospective mode are well-rehearsed: the labelling of those who resist as ‘backward’ so excluded from politics (e.g. Latour, 2015; Povinelli, 2017).

However, to go back to Latour’s arrow of time, it is not only the colouration of the past which is determined by the directionality of modern temporality, but also the future. Alternative approaches to the complexities of planetary imagination in the light of the Anthropocene tend to seek not to engage with the elsewhere as the past, but instead to point to it as offering resources for different imaginaries of the future, or future alternatives to the problematic model of industrial development. This seemingly more progressive stance is, however, similarly in debt to the modern structure of temporal distancing in relation to place, albeit in prospective rather than retrospective mode; elsewhere offers a representation of the future within the present (Osborne, 1995). There is a continuity of the basic temporal structure of historical self-definition and projection in which spatial others cannot be ‘now’, and cannot engage in the politics of the now. They may provide inspiration, imaginative resource, minor storylines, but their time is not the world historical time that is of relevance for progressive political projects, and nor can it be while the Anthropocene narrative remains embedded in the periodizing temporal structures of modernity.

The implication of anachronism is that rather than being able to see different knowledges and ontologies—Indigenous knowledges for example—as different they are instead translated into ‘our’ social grid of understanding (Povinelli, 2016: 154). As Chandler and Reid have argued, treating indigenous knowledge as a *resource* to teach us adaptation and resilience in the face of environmental change does not provincialize dominant western hegemonic practices (2018: 252). Rather than being disturbed or challenged by different articulations of the present it instead repackages such knowledge in the service of more effective governing practices (Chandler and Reid, 2018: 252). For those from whom we are seeking to ‘learn’ in order to avoid harm such a temporal ordering has deeply problematic implications. Framing Indigenous people as living in a ‘good’ relationship with nature, as Whyte (2018: 236) has argued, implies that the ancestors of Indigenous people ‘were not fully harmed through colonial, capitalist and industrial drivers of the climate crisis’. There is, he continues, no ‘Indigenous remnant unaffected by domination’ (Whyte, 2018: 237).

More broadly, the conflation of place, time and political difference means that different ontologies become produced as temporal difference. Ontologies that depart from enlightenment structures of rationality cannot form the basis for effective political claims. Of particular resonance in light of the Anthropocene debate, a number of authors have offered accounts of alternative Indigenous ontological claims as regards the interrelation of life/non-life in which land and thought are integral to one another: ‘our truth ... in a majority of Indigenous societies, conceives that we (humans) are made from the land; our flesh is literally an extension of soil’ (Watts, 2013 in Davis and Todd, 2017: 769). However, in order to make effective political claims Povinelli shows how such differences need to be rendered historically – as primitive or past. For example, Indigenous populations need to frame this relationship between human and land in *historical* terms in disputes about land rights, meaning that ‘Major social and analytic accomplishments that allowed people to survive the present [have] to be presented as a dumb totemic representation of the past’ (Povnelli, 2016: 80).

The spatio-temporal delimitation of the contours of politics then is one result of the directional and progressive temporality required in order to be able to make claims about the Anthropocene as period or epoch. However, such claims not only exclude what is other, but

in so doing produce what *is* proper to politics; they are not (only) reflective of already-existing difference in the world but they produce temporal difference. Kathleen Davis's (2008) work on the periodization of the medieval and modern provides one way to interrogate the implications of such production for thinking critically about mobilisations of the Anthropocene concept, by treating periodization as a political tool.

Periodized, progressive history does not reflect a distinction between periods, Davis (2008) argues, but creates one, and does so for particular political ends. Her focus is the medieval/modern periodization between which she argues there is no clear distinction; the distinction was/is a political tool used precisely to exclude unwanted elements or problems of European 'modernity' from political discussion (2008: 8). The timing of the specific self-identification of modernity, she continues, was no coincidence: 'at the very moment the colonial slave trade began to soar feudal law and slavery were grouped together and identified as a characteristic of Europe's past and of a non-European present' (Davis, 2008: 8). Periodization, on this reading, is a mechanism which allowed for the transfer of the slave trade to a brutal past.

Davis's approach is important for engaging with the Anthropocene because while, as above, the way in which periodization excludes particular elements from the (political) present and partitions off the past and the elsewhere is relatively well-rehearsed, her approach adds an injunction to consider displacement. It is not, on this reading, simply that other 'nows' cannot be accommodated and so are dismissed, but that the identification and content of the world-historical present — the main storyline — in making other places 'past' uses this demarcation to obscure and displace elements integral to its own functioning. This opens up the question of what is being displaced in seeking to demarcate the Anthropocene. One initial observation is that it is only as industrial production moves out of the west that the Anthropocene is identified, at least in the popular imagination, as that which follows after industrialisation. Industrial production is thus produced as part of the West's past, and the non-West's present. But industrial production, its problematic labour practices and disposal of its by-products remain integral to Western economies and ways of life; they are not past but displaced and outsourced.

The concern here is that a series of deeply problematic elements of contemporary western political and economic structures become framed as past and so excluded from political discussion when in fact they are potentially peaking, albeit elsewhere. Issues such as workers' rights, exploitation, unsafe working practices, poverty, waste disposal and so on are transformed into issues of 'our' past and of an elsewhere's, backwards, present; these are problems associated with industrialisation, and the West is post-industrial. Indeed, it is only from the post-industrial vantage point that the Anthropocene can be discerned: the claim that there is no natural anymore can only be made on the back of the industrial fabrication of the separation of human and nature. To claim globally that there is no natural anymore immediately renders the human/nature separation a historical marker through which 'other' places must pass if they are to progress through historical development.

Similarly, the narratives of dystopian *futures* used to animate calls for action on environmental issues displaces elements integral to the functioning of those places that are rendered part of the world historical present. As Whyte (2018: 226) argues, the things that nonIndigenous people dread about future of climate crisis are the ones that Indigenous people have endured already. Making these crises future concerns marginalises the history of

colonialism, the continued inequalities, practices and implications of which the functioning of those places inhabiting the ‘world historical present’ relies upon.

The necessary, geological, framing of the Anthropocene as global and globally synchronous underscores its claim to represent the world historical present. Issues of inequality, human rights, and injustice then become possible to displace and sideline as problems that are either past and elsewhere, or yet to come—they are old news in this new world of the Anthropocene, or part of dystopian future imaginaries. To return to the opening discussion of debates around the need to bring the non-human in to politics, I suggest that the exploration of these implications of periodization and epochalisation indicates a need also to bring the human into that politics. By this I mean a return to a focus on postcolonial, racial and global justice struggles which are produced as parochial, anachronistic, or out of date when read alongside claims about the new scale of planetary existential threat in the Anthropocene. The exclusion of the non-human and the exclusion of the human from politics are inextricably linked and neither are challenged by an Anthropocene discourse framed as another manifestation of the modern project of spatio-temporal epochalisation.

Plural Pasts, Plural Humans

The problems with which we are left are how to engage with the multiplicities (of scale, time, and actors) gestured to by the Anthropocene concept in the light of its embeddedness in modern temporal structures. Claims about human geological activity rely on temporal structures that anchor us to a modern political imagination which only allows for one account of temporality (an account which already contains the human and natural within it). We cannot engage with other (human or non-human) voices unless we also open up space to engage with different temporalities and worlds in which those voices have meaning.

The seeming disjuncture between geological activity and political passivity noted at the start of the article in fact reflects two sides of the same coin; it is precisely the framing of the human in terms of geological agency and the associated accounts of temporality that this reproduces which provides an (intensely political) set of limits on the political questions proper to the times, ones which cannot engage creatively with the ecological problems that the Anthropocene concept is mobilised to highlight. How then might we loosen the anchor points of our world in order that we might be able to be responsive to the plurality of worlds, to multiple ‘now’s, human and inhuman?

Looking outside the human, and towards the future, whilst seemingly responsive to the challenges of scale posed by the Anthropocene, in fact relies on and reproduces the organising logic of human/natural which provides a unified temporal scale. In our haste to escape anthropocentrism by seeking to engage with or reconfigure politics around the non-human there is a danger, as I have shown, that its central claims and effects get both reproduced and obscured because the construction of that non-human is already part of anthropocentric politics. To seek to escape anthropocentrism and look elsewhere (the non-human) in reconfiguring politics for the Anthropocene is problematic because that elsewhere is only constructed as such through the inscription of an exclusionary border within the modern subject. Similarly, looking towards the future within the framework of epochal thinking that currently dominates the Anthropocene debate determines that future within a progressive *kairotic* ordering principle. Looking forward does not engage with different temporalities on this account, but rather reproduces a singular account of the world historical present.

I suggest one way to open up possibilities of thinking multiple times, scales and worlds is not to look directly to plural futures or to expanding political structures or accounts of political community to include non-humans, but to start instead with attempts to articulate plural pasts, to revisit ‘commonsensical’ understandings of the intersections of geological and historical time which underpin dominant formulations of the human as species. That is, to look backwards and inwards as a counterpoint to the dominant discourse of the meaning and implications of the Anthropocene with its vocabulary of what will have been and the associated expansive conception of the human (see Colebrook, 2017; Yusoff, 2014).

The accounts of plural pasts gestured to above in debates about starting dates offers one route through which accounts of the human reliant upon linear conceptions of time might be destabilised. Highlighting the link between the Anthropocene and histories of colonialism shifts attention to the erasure of multiple temporalities and associated exclusionary accounts of the human upon which colonialism relies. The ‘end’ of the Native American world, for example, is on one account (the argument for the 1610 starting date) what allows us to perceive the Anthropocene (Whyte, 2018: 226). This account of the past entails a different characterisation of the present, which suggests that we live in multiple times and worlds. On this account the disaster of the Anthropocene is not coming, but has already occurred; ‘Native Americans have seen the end of their respective worlds’ (Gross, 2014 in Whyte, 2018: 227). The present in which Native Americans live is already marked by ongoing ecological (and other) disaster, their now entails living with the ends of their worlds in resistant ways, fostering ‘relationships to humans, other-than-humans and land today’ (Davis and Todd, 2017: 772).

Offering a different account of the present in and of itself does not, as I have shown above, challenge the broader assumptions on which the Anthropocene discourse rests; it remains difficult to allow for multiple ‘world historical’ presents on the timescales the Anthropocene imposes. However, being attentive to alternative constructions of the ‘now’ also points to broader possibilities for rethinking these temporal structures, and particularly for challenging the relationship between past, present and future which renders alternative presents only marginal storylines.

Elizabeth Povinelli’s work is instructive in this regard. She offers an account of Indigenous ontology which relies on the overlapping of past, present and future particularly in concepts of origins; ancestors are not ‘past’ but present, the dead and the living are in the same time and space (2016: 76). Similarly, Kyle Whyte (2018: 229) describes the Anishinaabe perspective, in which ‘current’ generations conceive themselves to be living alongside future and past relatives simultaneously. Ancestors and future generations offer articulations of being otherwise that are put in dialogue with the present (2018: 230). This gives rise to a spiralling account of time with forward motion that can be predictable and irregular (Whyte 2018: 229). This is in stark contrast to the temporality characterised by Latour’s ‘arrow of time’: the past is no longer stagnant and the future no longer progressive. Such accounts of temporality are challenging because rather than offering an alternative *kairotic* ordering principle they offer a different account of the relationship between *chronos* and *kairos* which is what opens up the possibility of thinking otherwise about the human/nature distinction. In Povinelli’s folded account of temporality ‘humans are and can become nonhuman agents’, they are ‘the descendants of ...posthuman creatures’ (2016: 153).

With the destabilisation of origins in mind, the geological timescales that the Anthropocene opens up can also be employed to revisit anthropocentrism and refocus on the mobility of the border between the human and non-human within the modern subject. Rather than seeking to move outside the human as such this shift would destabilise the category from within; the geological timescales opened up by the Anthropocene can also be used to put into question the species 'we' that dominant narratives of the Anthropocene rely on and reproduce. While authors such as Mirzoeff (2018: 18) urge a move away from species thinking because of its association with race, discussed above, engaging different temporalities found *within* the concept of species might also offer resources for a reorientation of the discourse of species. Such a lens highlights that species is multiple, and is not necessarily progressive; the human as 'special' begins to unravel and with it the exclusionary accounts of a progressive, unitary history with which it is enmeshed.

The geological scale opened up by the Anthropocene gestures not only to the scaling-up of thought, but also to a scaling down, to looking *within* the human. While a focus on the human as planetary agent reinscribes modern accounts of the human and the human/nature divide, as I have shown, interrogating accounts of origins has the potential to destabilise this account (see Yusoff, 2013). Such a focus, as found in contemporary human origins theory (e.g. Stringer, 2011) offers a spectral refashioning of the human as interspecies, inhabiting human and non-human (e.g. Neanderthal) time. The story of *Homo sapiens* emerging in Africa and then colonising the globe, wiping out all other human species in its path now looks more complicated: residual traces of other human genes found in modern humans suggest differential genetic intermingling (Kaplan, 2011).

An interspecies account shows how the non-human is not just part of our politics by exclusion, but *within* the human, and begins the work of unpicking the modern account of that human. It also undoes the idea of there being one history or one time for that species, and by extension for the planet considered as their homeland. The human on this account contains multiple temporalities within it; Neanderthal genetic traces suggest that rather than thinking of extinction as a future event marking the progressive culmination of human history, that such extinction is already part of the human species. The mobile border between the human and non-human within the modern subject is also a marker of different temporalities: there is not one time or world in which the human lives because it already both lives and is extinct, it already occupies more than one history.

Perhaps, then what is needed is a cautious return to a critical anthropocentrism as a site from which to examine the human, to challenge the Anthropocene's potential to be read in terms of an ecomodernist call to arms by turning its invocation of geological time and human agency against itself; the human is indeed a geological agent, but neither that human, nor the geologic timescales upon which it is now conceived as operating, will have been quite what we think they are.

Bibliography

Agamben G (2004) *The Open: Man and Animal*. Stanford: Stanford University Press.

Autin W and Holbrook JM (2012) Is the Anthropocene an Issue of Stratigraphy or Pop Culture? *Groundwork: The Geological Society of America* 22(7): 60-61.

Bai X, van der Leeuw S, O'Brien K, Berkhout F, Biermann F, Brondizio E S, Cudennec C, Dearing J, Duraiappah A, Glaser M, Revkin A, Steffen W and Syvitski J (2016) Plausible and desirable futures in the Anthropocene: A new research agenda. *Global Environmental Change* 39: 351-362.

Barnosky AD, Matzke N, Tomiya S, Wogan GO, Swartz B, Quental TB, Marshall C, McGuire JL, Lindsey EL, Maguire KC, Mersey B, Ferrer EA (2011) Has the Earth's sixth mass extinction already arrived? *Nature* 471(7336): 51-57.

Braidotti R (2013) *The Posthuman*. Cambridge: Polity Press.

Brown W (2005) *Edgework: Critical Essays on Knowledge and Politics*. Princeton, NJ: Princeton University Press.

Brown W (2017) Climate Change and Crises of Humanism. In: Baldwin A and Bettini G (eds) *Life Adrift: Climate Change, Migration, Critique*. London: Rowman & Littlefield International, Ltd., pp. 25-40.

Burke A, Fishel S, Mitchell A, Dalby S, Levine D (2016) Planet Politics: A Manifesto from the End of IR. *Millennium: Journal of International Studies* 44(3): 499-523.

Carrington D (2016) The Anthropocene epoch: scientists declare dawn of human-influenced age. *The Guardian*, 29 August. Available at: <https://www.theguardian.com/environment/2016/aug/29/declare-Anthropocene-epoch-experts-urge-geological-congress-human-impact-earth> (accessed 19 February 2018).

Chakrabarty D (2007) *Provincializing Europe: Postcolonial thought and historical difference*. Oxford: Princeton University Press.

Chakrabarty D (2009) The Climate of History: Four theses. *Critical Inquiry* 35(2): 197-222.

Chandler D and Reid J (2018) Being in Being: Contesting the Ontopolitics of Indigeneity. *The European Legacy* 23(3): 251-268.

Clark N (2014) Geo-politics and the disaster of the Anthropocene. *The Sociological Review* 62(1): 19-37.

Clark N and Yusoff K (2017) Geosocial formations and the Anthropocene. *Theory, Culture and Society* 34(2-3): 3-23.

Colebrook C (2017) Transcendental Migration: Taking Refuge from Climate Change. In: Baldwin A and Bettini G (eds) *Life Adrift: Climate Change, Migration, Critique*. London: Rowman & Littlefield International, Ltd., pp. 115-130.

Crist E (2013) On the poverty of our nomenclature. *Environmental Humanities* 3: 129-147.

Crutzen PJ and Stoermer EF (2000) The Anthropocene. *IGBP Global Change Newsletter* 41: 17-18.

Cudworth E and Hobden S (2011) Beyond environmental security: complex systems, multiple inequalities and environmental risks. *Environmental Politics* 20(1): 42–59.

Dalby S (2016) Framing the Anthropocene: The good, the bad and the ugly. *The Anthropocene Review* 3(1): 33-51.

Dalby S (2017) Anthropocene Formations: Environmental Security, Geopolitics and Disaster. *Theory, Culture and Society* 34(2-3): 233-252.

Davis K (2008) *Periodization and Sovereignty: How ideas of Feudalism and Secularism govern the politics of time*. Philadelphia: University of Pennsylvania Press.

Davis H and Todd Z (2017) On the Importance of a Date, or Decolonizing the Anthropocene. *ACME: An International Journal for Critical Geographies* 16(4): 761-780.

Fagan M (2017) Who's Afraid of the Ecological Apocalypse? Climate Change and the Production of the Ethical Subject. *British Journal of Politics and International Studies* 19(2): 225-244.

Fasolt K (2004) *The Limits of History*. Chicago: University of Chicago Press.

Fishel S (2017) Performing the Posthuman: An Essay in Three Acts. In: Eroukhmanoff C and Harker M (eds) *Reflections on the Posthuman in International Relations: The Anthropocene, Security and Ecology*. E-International Relations, pp. 50-60.

Hamilton C (2014) The new environmentalism will lead us to disaster. *Scientific American*, 19 June. Available at: <http://www.scientificamerican.com/article/the-new-environmentalism-will-lead-us-to-disaster/> (accessed 28 April 2018).

Hamilton C (2015) Getting the Anthropocene so wrong. *The Anthropocene Review* 2(2): 102-107.

Hamilton C (2015) The Theodicy of the “Good” Anthropocene. *Environmental Humanities* 7: pp. 233-238.

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

Harrington C (2016) The Ends of the World: International Relations and the Anthropocene. *Millennium: Journal of International Studies* 44(3): 478–498.

Hutchings K (2008) *Time and world politics: Thinking the Present*. Manchester: Manchester University Press.

Jackson Z (2013) Animal: New Directions in the Theorization of Race and Posthumanism. *Feminist Studies* 39(3): 669-685.

Johnson E and Morehouse H (eds) with contributors: Dalby S, Lehman J and Nelson S, Rowan R, Wakefield S, Yusoff K. After the Anthropocene: Politics and geographic inquiry for a new epoch. *Progress in Human Geography* 38(3): 439-456.

Kaplan M (2011) Human ancestors interbred with related species. *Nature Journal* doi:10.1038/news.2011.518.

Kolbert E (2014) *The Sixth Extinction: An Unnatural History*. London: Bloomsbury.

Kosselleck R (2004) *Futures Past: On the Semantics of Historical Time*. Translated by Keith Tribe. New York: Columbia University Press.

Last A (2017) We are the world? Anthropocene cultural production between geopoetics and geopolitics. *Theory, Culture and Society* 34(2–3): 147–168.

Latour B (2015) Fifty shades of green: Presentation to the panel on modernism at the Breakthrough Dialog, Sausalito, June 2015. Available at: http://bruno-latour.fr/sites/default/files/downloads/00-BREAKTHROUGH-06-15_0.pdf (accessed 7 January 2018).

Lewis SL and Maslin MA (2015) Defining the Anthropocene. *Nature* 519(7542): 171-180.

Macfarlane R (2016) Generation Anthropocene: How Humans have altered the planet forever. *The Guardian*, 1 April. Available at: <https://www.theguardian.com/books/2016/apr/01/generation-Anthropocene-altered-planet-for-ever> (accessed 07 January 2018).

Malm A (2015) The Anthropocene Myth. *Jacobin*, 30 March. Available at: <https://www.jacobinmag.com/2015/03/Anthropocene-capitalism-climate-change/> (accessed 07 January 2018).

Maslin MA and Lewis SL (2015) Anthropocene: Earth System, geological, philosophical and political paradigm shifts. *The Anthropocene Review* 2(2): 108-116.

McDonald M (2017) Ecological Security. In: Eroukhmanoff C and Harker M (eds) *Reflections on the Posthuman in International Relations: The Anthropocene, Security and Ecology*. E-International Relations, pp. 62-72.

Mirzoeff N (2018) It's not the Anthropocene, it's the white supremacy scene. Or, the geological color line. In Richard Grusin (ed) *After Extinction*. Minneapolis: University of Minnesota Press.

Mitchell A (2014) Only human? A worldly approach to security. *Security Dialogue* 45(1): 5-21.

Moore JW (2017) The Capitalocene, Part I: on the nature and origins of our ecological crisis. *The Journal of Peasant Studies* 44(3): 594-630.

Nancy J-L (1997) *The Sense of the World*. Minneapolis: University of Minnesota Press.

Oldfield F (2015) When and how did the Anthropocene begin? *The Anthropocene Review* 2(2): 101.

Osborne P (1995) *The Politics of Time: Modernity and Avant-garde*. London: Verso.

Povinelli EA, Coleman M and Yusoff K (2017) An interview with Elizabeth Povinelli: geontopower, biopolitics and the Anthropocene. *Theory, Culture and Society* 34(2-3): 169-185.

Povinelli E (2016) *Geontologies: A Requiem to Late Liberalism*. London: Duke University Press.

Raworth K (2014) Must the Anthropocene be a Manthropocene? *The Guardian*, 20 October. Available at: <https://www.theguardian.com/commentisfree/2014/oct/20/Anthropocene-working-group-science-gender-bias> (accessed 7 January 2018).

Rothe D (2017) Global Security in a Posthuman Age? IR and the Anthropocene Challenge. In: Eroukhanoff C and Harker M (eds) *Reflections on the Posthuman in International Relations: The Anthropocene, Security and Ecology*. E-International Relations, pp. 87-101.

Ruddick SM (2017) Rethinking the subject, reimagining worlds. *Dialogues in Human Geography* 7(2): 119-139.

Ruddimann WF, Ellis EC, Kaplan JO and Fuller DQ (2018) Defining the epoch we live in. *Science* 348(6230): 38-39.

Shukin N (2009) *Animal Capital: Rendering life in biopolitical times*. Minneapolis: University of Minnesota Press.

Steffen W, Broadgate W, Deutsch L, Gaffney O and Ludwig C (2015) The trajectory of the Anthropocene: The Great Acceleration. *The Anthropocene Review* 2(1): 81-98.

Steffen W, Perrson A, Deutsch L, Zalasiewicz J, Williams M, Richardson K, Crumley C, Crutzen PJ, Folke C, Gordon L, Molina M, Ramanathan V, Rockström J, Scheffer M, Schellnhuber HJ and Svedin U (2011) The Anthropocene: From global change to planetary stewardship. *Ambio* 40(7): 739-761.

Stringer C (2011) *The Origin of our Species*. London: Penguin.

Subcommission on Quaternary Stratigraphy (2017) *Chronostratigraphy*. Available at: <https://quaternary.stratigraphy.org/stratigraphicguide/chronostratigraphy/> (accessed 26 October 2017).

- Swyngedouw E (2013) The Non-Political Politics of Climate Change. *Acme: An International Journal for Critical Geographies* 12(1): 1-8.
- Szerszynski B (2017) The Anthropocene monument: On relating geological and human time. *European Journal of Social Theory* 20(1): 111-131.
- Vaughan-Williams N (2015) “We are *not* animals!” Humanitarian border security and zoopolitical spaces in Europe. *Political Geography* 45: 1-10.
- Waters CN, Syvitski JPM, Galuszka A, Hancock GJ, Zalasiewicz J, Cearreta A, Grinevald J, Jeandel C, McNeill JR, Summerhayes C and Barnosky A (2015) Can nuclear weapons fallout mark the beginning of the Anthropocene Epoch? *Bulletin of the Atomic Scientist* 71(3): 46-57.
- Whyte K (2018) Indigenous science (fiction) for the Anthropocene: Ancestral Dystopias and Fantasies of Climate Change Crises. *Environment and Planning E: Nature and Space* 1(1-2): 224-242.
- Wolfe C (2012) *Before the Law: Humans and other animals in a biopolitical frame*. Chicago: University of Chicago Press.
- Wynter S (2003) Unsettling the Coloniality of Being/Power/Truth/Freedom: Towards the Human, after Man, its Overrepresentation – an Argument. *The New Centennial Review* 3(3):257-337.
- Youatt R (2014) Interspecies Relations, International Relations: Rethinking Anthropocentric Politics. *Millennium* 43(1): 207-223.
- Yusoff K (2013) Geologic life: Prehistory, climate, futures in the Anthropocene. *Environment and Planning D: Society and Space* 31(5): 779-795.
- Zalasiewicz J, Steffen W, Leinfelder R, Williams M and Waters C (2017) Petrifying earth process: The stratigraphic imprint of key earth system parameters in the Anthropocene. *Theory, Culture and Society* 34(2-3): 83-104.