



Anthropogenesis: Origins and Endings in the Anthropocene

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Abstract

If the Anthropocene represents a new epoch of thought, it also represents a new form of materiality and historicity for the human as strata and stratigrapher of the geologic record. This collision of human and inhuman histories in the strata is a new formation of subjectivity within a geologic horizon that redefines temporal, material, and spatial orders of the human (and thus nature). I argue that the Anthropocene contains within it a form of *Anthropogenesis* – a new origin story and ontics for man – that radically rewrites material modes of differentiation and concepts of life, from predominantly biopolitical notions of life toward an understanding of life's geophysical origination (geontics). Here, I use the term *Anthropogenesis* to suggest that two things explicitly happen in the nomination of the Anthropocene: 1) the production of a mythic Anthropos as geologic world-maker/destroyer of worlds, and 2) a material, evolutionary narrative that re-imagines human origins and endings within a geologic rather than an exclusively biological context. In contrast to the homogeneous geomorphizing of the Anthropocene, I suggest that socializing the strata needs a more nuanced notion of 'geologic life' that challenges the construction of the Anthropocene as an undifferentiated social stratification.

Keywords

Anthropocene, feminist theory, genealogy, geology, human origins, inhuman, nature

First Man, Last Man

Observe now your own epoch of history as it appears to the Last Men. (Stapledon, 2004: 1)

In Olaf Stapledon's classic science fiction novel *Last and First Men* (1930), he asks us to imagine a future epoch-making contact with the present age. He invites the reader to take an imaginary journey through the aeons that separate the ages: 'Do but entertain, merely as fiction, the

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idea that the thought and will of individuals future to you may intrude, rarely and with difficulty, into the mental processes of some of your contemporaries' (Stapledon, 2004: xvii). Stapledon's history of the past and future told through the present has an apt parallel in the designation of the Anthropocene, so much so that Crutzen and Schwagerl ask us to:

Imagine our descendants in the year 2200 or 2500. They might liken us to aliens who have treated the Earth as if it were a mere stopover for refueling, or even worse, characterize us as barbarians who would ransack their own home... Remember, in this new era, nature is us. (Crutzen and Schwagerl, 2011)

Like Stapledon's conversation between *Last and First Men*, the nomination of the Anthropocene as an epochal shift poses a material 'conversation' between the beginnings and ends of 'man' [sic]¹ articulated by writings in the geologic record, in which 'future man' is posited as the fossil witness to the ends of humanity. In this 'nature is us' moment, the Anthropocene authors name humans as an end in themselves – both as a distinguishable trace in the geologic strata and as author of the end – a stratigraphic writer, reader, and agent of geology *and* nature.

There is not just the beginning and an end time of the Anthropocene to consider here, but the spectral figure of the 'last men' who will read the record and presumably care enough to raise sensible questions about the immortality/immorality of humanity. There is a barely visible future geologist lurking in this imaginary who will diligently read our future-anterior bones, our plastics, our mining trails and holes; a future geologist who will make us 'subjects' of a forensic investigation. Such a geologist, we might imagine, may even ask questions about the furious destratification that characterizes capitalism and its love of the planetary fossil feedstock. But this future geologist is a foil, a material and discursive device to trace a geologic sentience back and forth across this epochal threshold. The future geologist harbours the promise of reading the earth through these future fossils, as a cogent text of eventful occasions, rather than seeing the earth's materiality as subject to a range of geologic forces that are accumulated in bodies to constitute the possibilities of force (corporeal and geopolitical). A fleeting evolutionary expression of geologic force is transformed into an immortal signature on the earth. This position of the future man generates a future anterior of 'humanity' to the *now* of these geologic processes of fossilization and their specific social and political contexts (for example, cities as geologic entities partaking of geologic life). Future humanity, then, becomes an erasure of contemporary social differences and inequalities.

The figure of the future geologist, rather than proposing the question of the ends of man as a moment of finitude (of capitalist expenditure, humanist thought, the end of *this* or *that* man), is actualized as an

anterior position of survival that speaks to the ‘ear of the future’ (Deleuze, 2009: 176); so it is axiological in the production of humanity’s beginning and end, but undeterred by exclusions that govern its present. The Anthropocene both names the spectre of a fossil-fuelled geologic life that haunts the present (while leaving it unexamined in geopolitical terms) *and* opens up an epochal rift for speculative contemplation that extends well beyond industrialization and capitalism into evolutionary futures. This nomination also instigates a new form of geologic self-witnessing; the praxis of a *geo-logic* of life forces as geologic forces.

In the designation of the human as geologic stratigraphic trace, a new kind of question is posed about human history and its material and discursive capacities, as both the author and recipient of new origin (and ending) stories that are secured in a mineralogical rather than meta-physical or biological ground. Here, I use the term *Anthropogenesis* to suggest that two things explicitly happen in the nomination of the Anthropocene: 1) the production of a mythic Anthropos as geologic world-maker/destroyer of worlds, and 2) a material, evolutionary narrative that re-imagines human origins and endings within a geologic rather than an exclusively biological context.

Given the intermingling of human origins narratives in philosophical and political questions about the nature of man [sic], his histories, trajectories and genealogy, these mythic and material qualities always implicate each other. Geology is always involved in ontological questions precisely because of its empirical function in generating origin stories. New fossil finds literally restratify genealogical accounts (Yusoff, 2013a). But, what kind of historicity does the human possess if it is a being that can both read and write its own future in the rocks (given that the Anthropocene is understood by geologists as a materially inscriptive process)? While the imaginative capacities of the authorship and witnessing of the future are hardly new in literature or theology, the materialization of such narratives in the ‘ground’ of the earth suggests new forms of mattering. These move beyond the earth as vengeful protagonist (Gaia) or spoilt commons (stewardship, limits discourses) into a consideration of the earth (and humans) as defined by geologic forces that release new ways of being in both an evolutionary and geophilosophical context.

The Anthropocene can be seen as a remineralization that is prompting reflection of the future fossilization of humanity, thus returning to what Caillois calls the ‘defiant hold’ of mineral perpetuity² that ‘life’ was previously seen to have broken away from. This is largely a result of being able to ‘take up’ a bloated payload of geologic force, courtesy of fossil fuels. In this sense the Anthropocene represents a moment of acknowledgement of a geologic social body politic, but in which our discourses for the critique of power (i.e. biopolitics) are configured to a version of ‘life’ that does not take account of this geology. In this elision of geologic force and bodies politic, a notion of the sentience of rocks is being

surreptitiously offered up in exchange for stratigraphic agency. By recognizing humans as geomorphic agents, there is a change in the materiality of a human signature in relation, or difference, to nature and geology. If humans now author the rocks, atmosphere and oceans with anthropogenic signatures then the inhuman (as nature, earth, geology) becomes decidedly changed as a category of differentiation.

While anthropogenic thought is emergent and heterogeneous (see Castree, 2014a, 2014b), there are some moments of shared concern and points of interrogation around the relations and terminology of the Human (as humanity and, in some cases, humanism), Nature (geologic and inhuman) and Time (historicity, mortality and inhuman time). The precise 'nature' of the Anthropocene – its social geology – that is defined in contrast to, and in collaboration with, human social formations is ambiguous. If the Anthropocene is the nomination of the 'geology of mankind' (Crutzen, 2002), it is a double inscription of human and nature that represents a new socializing of the strata. In this paper I want to make two arguments:

1. Scientific literature on the Anthropocene both naturalizes 'humanity' (culture is made into nature) and reintroduces the nature/culture split.
2. The epochal identity of the Anthropos is subtended by the geologic power of fossil fuels. Focus on human agency obscures the dynamics of geopower, and its actualisation through geosocial formations in the processes of Anthropogenic change. The understanding of the origination of geopower has consequences for how agency is thought and the field of intervention is constructed.

What is often called into question in the Anthropocene is the impact of man as a material agent *on* the earth, but what is not often remarked upon is the supposed unity of the 'Anthropos' as it is gathered *into* the geologic as a form of collective material subjectivity. And, how geologic identity establishes new forms of subjectification for humanity that obscures understandings between what is and is not taken to be humanity's outside, as well as the social stratifications (Deleuze & Guattari, 1993) that constitute its inside. The designation of a geologic epoch actually requires a universal 'golden spike' to be indifferent in its global stratification so that it can be 'read' as a ubiquitous trace around the globe. But this search for a uniform material signature, a monument for man, represents a renewed quest for fundamentals in the nature of 'man' queried through a worldly biographical inscription. If man is understood as an undifferentiated trace in the strata, the differentiated social practices of destratification cannot be understood in their proper geologic relation *as* differentiated (this raises the question of what forms of difference matter in the Anthropocene, e.g. fossil fuel powers, ontics, capitalism, population, race, gender, consumption etc.?). I am interested here in how humanity is deployed as a method of erasure that obfuscates

climate racism, social injustice in fossil fuels, and differentiated histories of responsibilities through homogenization in a 'we' of the Anthropocene. If de- and re-stratification (Clark and Hird, 2014) is understood as socially productive in its capitalizing upon different kinds of 'geopower' (Grosz, 2012), which in turn constitute geopolitical capacities, the specific modes of biopolitical differentiation that stratify social life need a politics sutured onto geologic, rather than exclusively biological, accounts of life. So questions of power, in the first instance, are also ontological questions about the entities that are deployed in anthropogenic thought to conceptualise the account of power relations.

While the Anthropocene as a concept and geologic epochal claim is not an actual 'thing' *as such*, it names a threshold-ing of geophysical forces; it gives a body and agency to geology as the substratum to life and its conditions of survival. The Anthropocene is a new password, but a password to what? What does it open and what does it foreclose? As a keyword the Anthropocene is certainly promiscuous, but if it becomes a catchall term for environmental effects and sensibilities it will not change the language of thinking that carries it (and this is evident from the neoliberal 'solutions' that are coming forth from the science community). On the other hand, the Anthropocene has provided an aesthetic-political concept for that realization of geologic life, allowing for possibilities of thinking the earth as a generator of those modalities; it names this sensation of *becoming-geologic*; the rupture of the end of the Holocene and climate stability; and a new state of geophysical earth-becoming that promises to be less forgiving in the removal of the ground, both literally and figuratively. Thus the Anthropocene contains presuppositions that have yet to be analysed; namely, the extinguishment of the late Holocene subject, whose geologic-philosophical milieu is humanism. So the Anthropocene contains within it a speculative humanism that is speculating on humanist³ trace-effects, be those the very concept of the human *itself* as an organizing structure of meaning or the normative organization of knowledge as being *for* rather than *without* a subject (Hird and Yusoff, 2015).

This *proto-anthropogenic subject* whose death is signalled through this epochal shift heralds a new philosophy in which the earth returns not to ground the figure of thought, but as a condition of its labour; thought must continually move through and with the inhuman, before, during and after subjectivity. So there is a shift in register from humanist thought, which characterized the inhuman as a dehumanizing force, to a concept of the inhuman as materially constitutive of the possibilities of life. What this means is that there needs to be a consideration of the earth as an inhuman substratum that preconditions what life becomes; the inhuman as a substantive force in the maintenance and continuance of various modes of subjectivity, and after subjectivity – in so much as thought goes on beyond the body to territorialize not just the earth

but future earths (that is, thought has an inhuman quality that literally mobilizes its geologic signature in the earth as both a thought experiment and as an actualization of its current Anthropocene labours). Thus the inhuman is co-present in its determinations of the subject, and yet this geology is mostly bracketed out from subjective experience or placed outside the corporeal body (i.e. it is seen as *unthought* and *unlived*). Thus the Anthropocene has a heterogeneous identity, poised as it is on the threshold of new geophysical and gephilosophical conditions *and* late Holocene humanism (and its attendant structures of thought and definitions of modes of being that imagine a singular nature for the human subject).

The nomination of geologic subjectivity also recognizes the capacity of humans to mobilize earth forces, and so its speculative explication entails asking: *can a geological account of life be joined to a biopolitical critique? What kind of geology does a body live? And, how does geology take us beyond a body and life itself into the consideration of other inhuman forces that have cosmic rather than teleological trajectories?* As a concept the Anthropocene contains two possible paths for developing a feeling for community and concerns over its futurity: a moral demand to recognize the present as a space of excess generated by the crossing of planetary thresholds with dire future consequences (this is the version currently articulated by some geologists and proponents of planetary limits/earth system governance); or the laying open of radical political possibilities that might transform what the Anthropocene becomes as a geologic epoch (this version sees the Anthropocene as the consequence of geopolitical formations that are deeply enmeshed in the mobilization of earth forces).

In what follows, I want to stay with the 'promise' of the Anthropocene as the configuring of an epochal moment of planetary thought, despite, and possibly because of, all the explicit problems that make the Anthropocene both an easy target and a malleable term. These are the problematics associated with grandiose nature-culture divisions, the gendering of 'man' as the subject of this epoch, the imperial basis of western science, climate racism, uncritical social figures such as 'humanity', recourse to the 'population problem', and the mimicking of global geopolitics in assumptions about reach, scale and control (Rowan, 2014: 448). This promise of a change in geophysical 'ground conditions' would not be served well by a semantic or reactionary critique, because it would exclude the provocation of a thinking a new earth. While I am critical of attempts to substantiate the Anthropocene in the aforementioned ways, such attempts at speculation on what constitutes a collective geologic social body *do* inadvertently open up a space of speculative thought that other disciplines can take elsewhere. Pressed far enough, one could even see this speculation as a form of geologic communization (in the sublimation of the catastrophe of geology as a world of

expenditure⁴ for all, albeit highly differentiated and rarely the basis of solidarity). Or, at the very least, humanity-as-strata forms an ontological rupture with humanist perspectives of humanity as exclusively unified by social forms. So, it *is* a rebirth in so much as definitions of *being* must now acknowledge an eternal but shifting mineralogical root; no one is not compromised or enriched by fossil fuels extraction, and in this sense it *is* a unity from below, but one that is highly differentiated and shot through with relations of power. So staying with the promise of the Anthropocene is rather precarious because it entails taking up the (inhumanist) space that is opened by the concept while refuting the basic architectures of thought that structure that space (where humanity is used as a term of erasure of material and political forms of differentiation).

Holding with the promise that the Anthropocene brings is not some endorsement of 'We Have Always Been Geologic'. Rather, it is about tracing the power relations and relations of force in geophysical events, and how those power relations might be materially constituted and thus have social effects. The first step in such a genealogy⁵ of knowledge production is to address the processes of subjectification that are involved in producing the object of knowledge (qua Foucault, 1998: 460): specifically, to see what modes of subjectifications make it possible for a subject (Anthropos) to become an object of possible knowledge (Anthropocene).

Taking seriously the 'birth' of a geologic subject as a consequence of anthropogenic thought might yet offer the opportunity to move beyond the narrow terrain of the biopolitical and 'life itself' as the organizing concepts for planetary existence. The 'origin' of the Anthropocene, the intra-polation of geology into the social strata and a founding story of its human 'creation' through a complex range of historical mineralogical practices (use of fire, industrial revolution, agriculture, capitalism) force us to think about social and geologic strata together; as geosocial formations (Clark and Yusoff, 2014) of power. The Anthropocene offers this context for rethinking the nature of our relations with the earth, for seeing those relations as *prima facto* geologic relations rather than solely biological ones (and thus reconsidering the nature of human powers within a broader context of geopower). There are risks in residing in this ambiguity, because to make the Anthropocene an effective social tool the avatars of the Anthropocene have reined in such relations to problematic figures (Humanity, Nature/Culture) and practices (neo-liberal governance). Yet, there is also value in practising generosity towards the attempt to name this threshold moment and its forms of material and linguistic mattering, however *improper* that name might be. And further, to consider, in this attentiveness to the evocation of the Anthropocene as a geologic calling, what 'tests' a proper name might need to endure (or, how we might move from anthropogenesis to

geogenesis in the genealogy of geologic life). These ‘tests’ are centred on how to remain with a politics of differentiation which is crucial in order to ‘ground’ the Anthropocene in its specific forms of uneven production and precarity, while staying with the promise of the geologic to reorganize our understanding of human life as located in a larger field of materiality.

In this paper I make a series of propositions that open up the question of the combined historicity of the human and the geologic, and explore how the fusing of these concomitant territories in the strata (as is proposed in the formulation of the Anthropocene) produces both a *proto-human* – a human-as-fossil-to-come, through the configuration of the future as an occasion of fossilized humanity – and a *new originary moment* for the human, as the author of an epoch of social geology – geology as a social phenomenon and the social as geological, thus, humanity as a more-than-social configuration, differentiated by inhuman forces. The point is that in the Anthropocene geology has become political and infused with social questions, and social theory must grapple with inhuman qualities that frustrate a straightforward account of power. I want to argue for the importance of critiquing this moment of anthropogenesis in two ways. Firstly, as misplaced in its designation of an originary moment in material histories of the earth that belong exclusively to *Anthropos*. Secondly, as a narrative that propagates various forms of social and sexual reproduction through the imagined historical relations that led to this epochal moment. At the same time, I want to hold with the importance of introducing inhuman qualities into the field of social theory.

The social reproduction of ‘Man’ as a figure and origin for this epoch actively excludes the apprehension of important forms of differentiation and genealogical critique that might be useful in forestalling the continuation of the very conditions that produced this threshold moment. In opposition to the ‘chimeras of origins’ (Foucault, 1984: 80) that tend an axiological path of the past and future through the present, Foucault argues for a genealogical account that attends to the ‘singularity of events outside of any monotonous finality’ (Foucault, 1984: 76). He says:

Genealogy does not pretend to go back in time to restore an unbroken continuity that operates beyond the dispersion of forgotten things; its duty is not to demonstrate that the past actively exists in the present, that it continues secretly to animate the present, having imposed a predetermined form on all its vicissitudes. Genealogy does not resemble the evolution of a species and does not map the destiny of a people. On the contrary, to follow the complex course of descent is to maintain passing events in their

proper dispersions; it is to identify the accidents, the minute deviations – or, conversely, the complete reversals – the errors, the false appraisals, and the faulty calculations that gave birth to those things that continue to exist and have value for us; it is to discover that truth or being does not lie at the root of what we know and what we are, but the exteriority of accidents. (Foucault, 1984: 81)

Anthropogenesis is the institutionalization of this originary moment (or genesis story) for humanity as an organism capable of geologic force on a planetary scale and of an epochal duration. The prosthesis of origin – *Anthropos* – for a new geologic epoch stabilizes a narrative of geologic forces within contemporary environmental discourses, while failing to recognize that the inhuman is not a supplement of the human, but its *non-origin*; ‘not a timeless and essential secret, but the secret that they have no essence or that their essence was fabricated in a piecemeal fashion from alien forms’ (Foucault, 1984: 78). While geologic forces are recognized as dynamic forces in the world that are productive of, and subtend, geosocial relations (Clark and Yusoff, 2014: 22), there is a conceit in the comprehension of the origins of these forces in the Anthropocene which fails to take into account the play of energy and mattering of minerals with no particular ends. Rather, everything is reined into the possibility of holding power to account, in terms fixated on the ends of humanity and its supposed bloated biomass of population (and the thinly disguised racism that accompanies this population discourse). In this way, geology loses both its temporal and cosmic expansiveness *and* its specific exactness as a determining force within geologic life. The resistance to making man an end in himself is what Nietzsche means when he says man must *remain faithful to the earth*. He says:

Man is a rope, tied between beast and overman – a rope over an abyss . . . What is great in man is that he is a bridge and not an end: what can be loved in man is that he is an *overture* and a *going under*. (Nietzsche, 1978: 15, emphasis in original)

The Anthropocene has made man an end and origin in himself, eliding the necessary ‘going under’ that a political excavation of material relations might achieve (such an exhumation would not allow Steffen et al. (2007: 619) and Crutzen and Schwagerl (2011) to proclaim that salvation can be found in the soft tools of neoliberal governance, for example). For Nietzsche, giving up on the engagement with the cosmos, the ‘chaos in oneself’, which ‘going under’ represents, is truly the act of the ‘last man’ (Nietzsche, 1978: 17).

The name of the Anthropocene is a deprivation of an outside to human time – the removal of deep time as a ground and measure against which human finitude is exposed (as well as an obfuscation of the deep

energy debit that subsidies from the Carboniferous provide). This manoeuvre collapses the division between history and geology as differentiated temporal occasions. Thus, humanity (mis)names itself as a capacity within the forces of the earth that has a geologic duration, and thus it names itself as an organism that matters as an occasion in the earth's catastrophic record (that which is named geology) rather than an organism that has acquired geopowers from fossil fuels. While geology as a discipline is the product of human signification, and this new nomination could be seen simply as an extension of those epochal names (Eocene, Jurassic, Devonian, Cretaceous, etc.), rocks as a stratified material record tell us that these are proper names. They do so by demonstrating the differentiation of time and environments in a way that corresponds to the sedimented material archive denoting catastrophic passage of organisms. According to Caillois, 'writing in the rock is the signature of time itself' (Caillois, 2008: 29). There is also a material relation to genesis in geology in so much as the fossils that substantiate the language of the geologic record are a lexicon of the catastrophe of natal and extinction moments (only sediments form a history; they are artefacts for later on, after the fact, after the Anthropocene is literally made and already becoming something else).

In terms of the relationship between genesis and geology, prior to Darwin we might think that 'genesis governed geology', yet post-Darwin geology acquired a distinct, almost functionary role as the empirical bedrock, evidencing the duration of processes of change (life being one among many such processes). Reflections on 'deep time' in the nascent discipline of geology (particularly in the work of Lyell and Hutton) and Darwinian ideas of the evolution of the species (*Origin of the Species*) co-evolved, destroying a biblical link that placed earth history within the genesis of Adam. Although Darwin only explicitly deals with human origins in *The Descent of Man* (1871) (Spears, 1996: 345), Darwin's understanding of the deep time of geological processes was central to understanding how natural selection could shape and rework life in the widely divergent paths seen in the fossil record. As Spears comments:

In the *Origin of the Species*, however, a new time frame for both humans and natural history serves as a necessary premise for evolutionary theory's larger and more controversial claims regarding the mutability of random mutations in the struggle for existence. (Spears, 1996: 344)

Yet the transcendence of genesis returns as a site of thinking in the Anthropocene (and is often found in scientific papers in the more secular guise of an appeal to human consciousness as a mode of intervention and reflection on the anthropogenic legacy), while the fossil record remains

crucial to understanding orders of time and concepts of evolution (human and otherwise). It is this historical role of a geologic perspective – in securing understandings of natural selection in the harnessing of the powers of the earth and unlocking the incremental changes that constitute an understanding of evolution – that propel any geologic understanding of human life into an evolutionary context, thereby claiming a stake in more than the present, and in the authorship of life at the scale of the planet, species or population.

There is something perverse in the temporal compression of the Anthropocene in its recourse to anthropogenesis, because it mollifies cosmic orders of time by passing them through the small envelope of the human. In this way the human as an organism is made originary rather than parasitic of earth forces and is given a power of duration that far exceeds human sensibility (to contemplate the forces of the cosmos that motivate earth is to open up time to the seemingly infinite, even as we know the sun will one day burn itself out and be but a celestial fossil of the universe). This quieting of the cosmos by way of an originary supplement of epochal planetary claim institutes a form of anthropogenesis into geologic history. This would not be problematic in and of itself were it not for the (mis-)location of power as within the domain of the human rather than derived from outside. Anthropogenesis does not acknowledge the human power to *force* geologic forces, rather it claims these geologic forces as its own, thereby missing important interstices of human-geologic power – namely, preferences for fossil fuels which have opened up geologic forces that far exceed any human capacity per se and the proclivity of fossil fuels to incite new forms of experimentation.

This capacity to *force* geologic forces has had a range of intended, and some unintended, consequences, such as anthropogenic climate change. This prodigious revolution is the result of a species-specific engagement with fire (Clark, 2012) and the increasing aptitude for the most intense and concentrated forms of burning. But while this techne of combustion may be seen as specific to a fire species, it is the condition of a fire planet that gives itself to the burning with or without humans (Clark and Yusoff, 2014). The evocation of a combustible planet may seem somewhat abstract until it is remembered that the organisms that populate the geologic record are simply an *effect* of great shifts of energy balance on the surface of the earth, rarely its originators or genesis. In joining the origin and effect of a great energy shift in the human, the logic becomes self-referential, and buried within forms of auto-affection and self-examination. Anthropocene geo-logic would do better to look beyond the human organism to the ‘life’ of other matter, its energetic incitements and the specific forms of inequality that result from the differential harnessing of these geopowers.

It is not necessarily a question of these accounts appropriating what is designated as geology/nature (in Crutzen’s, ‘nature is us’) in the

Anthropocene, but of reducing the distance between terms so that geology becomes available as an extension of human powers. There is an anthropomorphizing of nature as *subject to* rather than as *subjecting of* geologic forces. This reduction of the distance between man and nature has direct consequences for the forms of governance and modes of environmental relations that are imagined and enacted – take, for example, geoengineering in its propagation of the perception of an ‘open’ (and compliant) geosphere that is chemically or biologically responsive to human forces, which mistakes what is actually the forcing of other geologic forces for a human force (Yusoff, 2013b: 2806) – such that Crutzen and Schwagerl declare:

For millennia, humans have behaved as rebels against a superpower we call ‘Nature’... A long-held religious and philosophical idea – humans as the masters of planet Earth – has turned into a stark reality. (Crutzen and Schwagerl, 2011)

Their solutions for ‘The Age of Men’ is a green economy led by technological innovation and market solutions (from genetic modification to iPads for farmers), and funding for science and geoengineering. The imagined earth-as-subject of human powers enlarges the sphere of possible actions within the earth, and thus stimulates the generation of a range of practices to satisfy this imaginative claim (e.g. geoengineering). This ‘change of relation’ both acknowledges *and* erases the role of human geomorphic action, amplifying the reach and scope of intervention while simultaneously tacitly accepting the inadvertently dangerous human interventions into the material economies of the earth. In this sense the Anthropocene does engineer a kind of difference in its intercepting and amplifying of geologic relations within social histories. While the major claim of the Anthropocene is the designation of the human as geologic earth-writer within a material inscriptive lexicon, there are actually several geologizations going on.

1. Firstly, there is the ‘nature’ of the man that is originator of this epochal scene and his unitary designation in the strata *as a collective*, and how the imagination of this collective subjectivity as a common image and destiny for humanity impacts on understandings of what nature and what humanity *are*. Raising the sign of man institutes structures and modalities of thinking the human, its material relations, and unity as a communization of the strata or collectivization without differentiation. If an epoch is a point at which time stratifies into discernible historical events, it also holds within it internal geosocial stratifications that complicate the ground of that event. Yet, the earth-writer of the Anthropocene has no linguistic, historic, temporal, cultural, geographical or sexual difference, and so ‘his’ origins appear unlocatable and undifferentiated. The Anthropocene is not just a name that designates the sign of man, but it installs a universalizing material identity

for the human and establishes a teleology that homogenizes the trajectory of all peoples into one, under the dominance of that sign. In this sense, the Anthropocene proposes a formal mineralogy for the human that is not so much metaphysical as geophysical (originating and returning to an uncontested 'common ground').

2. Secondly, there is the renaturalization of origins and endings in the Anthropocene, as we become geomorphic in 'our' agency and therefore sedimented into geology as a foundational ground to being (the earth becomes a product of human relations and thought). This naturalization of man in the strata constitutes what the human *is* and arranges the historical trajectory of what it *ought* to become. Thus the tie of origins and endings makes it necessary to be attentive to *how* the question of man is raised.
3. Thirdly, the Anthropocene renaturalizes a unified human signature into earth history, thereby making the earth and history one and the same, and thus its own. The earth literally becomes subject to the signature of man. As evidenced by Crutzen and Schwagerl: 'The long-held barriers between nature and culture are breaking down. It's no longer us against "Nature". Instead, it's we who decide what nature is and what it will be' (Crutzen and Schwagerl, 2011).
4. Lastly, there is a contradictory movement in the Anthropocene; this new 'nature' opens up the possibility of man becoming something completely other than himself in an affiliation with rocks, and yet he is still himself – what he always was – man. A similar contradiction exists in the search for a distinctive human signature in the geologic record. Geology exhibits 'dumb objects' in the atrocity museum of geologic events, and yet human geology wants to claim both this position and one anterior to it – to make human geology somehow exceptional in how it 'receives' geologic events.

What is the 'Nature' of the Anthropocene?

Crutzen, Steffen and McNeill suggest that the Anthropocene is the epoch in which humans have become a global geophysical force, and they ask: 'Are humans now overwhelming the great forces of nature?' (Steffen et al., 2007), instituting a bifurcation between humans and nature (Crutzen, 2002). The Anthropocene's origins are dated at around 1800 with the onset of the industrial revolution and the enormous expansion in the mobilization of fossil fuels (other commentators suggest a much longer Anthropocene tail that dates back to the birth of agriculture, the domestication of animals or the controlled use of fire). The authors use CO₂ concentration as their indicator to track the Anthropocene from the 1800s to the time of the 'great acceleration' in the 1950s when fossil fuel usage intensifies (Steffen et al., 2007: 614). The Anthropocene is defined as the human-driven alteration of: 'i) the biological fabric of the Earth; ii) the stocks and flows of major elements in the planetary machinery such as nitrogen, carbon, phosphorus, and silicon; and iii) the

energy balance at the Earth's surface' (2007: 614). The rationale for the Anthropocene, the authors argue, is that the earth has now left its natural geological epoch (the present interglacial state called the Holocene)⁶ and 'Human activities have become so pervasive and profound that they rival the great forces of Nature and are pushing the Earth into planetary terra incognita' (2007: 614). What these authors propose is that humans are writing the earth as nature's rival (culture), or culture learning how to write as nature, writing man into the earth.

This man that has surpassed his planetary limits is a return to the fold of earth – humans as participative in the flows of the earth; then, it is also a form of re-ontologizing *man as nature* by way of culture. Yet the authors of the Anthropocene want nature to remain distinctly separate from the machinations of culture and its bad planetary management (which aspires to good planetary management, if it could just be cognizant enough). Does this evocation of man as nature's rival hold within it the fantasy of reason (culture), a Kantian sublime that transcends rude nature? The authors continue:

Preindustrial societies could and did modify coastal and terrestrial ecosystems but they did not have the numbers, social and economic organisation, or technologies needed to equal or dominate the great forces of Nature in magnitude or rate. Their impacts remained largely local and transitory, well within the bounds of the natural variability of the environment. (Steffen et al., 2007: 615)

So, there is also the suggestion that culture is 'out of bounds', and yet it is culture that can 'solve' the problem through its:

i) interdisciplinary work on human-environment systems, ii) the enormous power of the internet as a global, self-organizing information system, iii) the spread of more free and open societies . . . and iv) the growth of democratic political systems.

They conclude: 'Humanity is, in one way or another, becoming a self-conscious, active agent in the operation of its own life support system' (Steffen et al., 2007: 619).⁷

While the Anthropocene signals a reclassification of 'man' and his agency, what orders of classification does this reclassification draw on, maintain and institute? What hierarchies does it create and what causalities? What does it obliterate and obscure? And, how does nature's return as 'rival', and thus repository of the dialogic imagination of culture's other, thereby reconstituting human exceptionalism through geologic agency? In solemn tones, it is proclaimed that man as possessor of geomorphic power also becomes responsible for the world. Responsible for the world! As if the earth were available for human responsibility.

As if the world originated for the conscience of man (this is anthropogenesis), rather than the pleasure of snails or the proliferation of bacterial ingestations over millennia, or the shuffling of pebbles and erratic boulders, as if the genesis of the world was for 'us' alone.

The Anthropocene as a term and concept is awkward because, on the one hand, it delivers a concept that speaks on the *scale* of the earth to name both a revolution of the earth and a new form of geologic becoming (or social geology) for the human. But, on the other, the Anthropocene carries forward and edifies all the structures of thought and processes of undifferentiation that have been detrimental to any sustained attempt to challenge human exceptionalism (and all this entails in the determination of the earth as a foundational resource). The Anthropocene is held up as a cautionary tale, and as critical geologists have observed, it is more symbolic than material, more suited to the designation of an 'age' rather than an 'epoch' in geologic time. As Jan Zalasiewicz reflects:

The word quickly entered the scientific literature as a *vivid expression* of the degree of environmental change on earth caused by humans, and is currently under discussion as a potential formal unit of the geological time scale. (Zalasiewicz et al., 2011: 835; my emphasis)

The Anthropocene in its scientific formulation wields a sublime power over these geologic events through its optimistic promise of self-awareness and yet, ironically, the material legacy of the Anthropocene points in completely the opposite direction, confirming that this awareness has not been very much in evidence; or rather, it has been sabotaged by other competing petrochemical loves, so that various forms of extinction have been chosen in exchange for fossil fuelled gratifications. So, does the Anthropocene hold too many assumptions to make it a useful nomination? I want to list 10 reasons to question the formation of the Anthropocene, and suggest some other points of departure for this new epoch of thought.

1. Man subsumes nature (becomes responsible and rival to nature), while remaining intact as an entity outside of or divided from nature, maintaining the nature/culture division. Nature is literally incorporated and then excreted in this process, yet without disturbing the corpus of the man (as Michel Serres maintains, man claims geography through his material and psyche wasting powers – see Serres, 2012). This nature/culture division creates a new temporal moment of geology that is authored by man that fails to acknowledge *how* and *where* material agency is conferred. Geomorphic power is conferred as an extension of human capabilities, a *techne* of the human, rather than as a condition that belongs to the earth.

2. The divide of nature/culture obscures the social incorporation of geologic forces. If we take Vicki Kirby's provocation to think, 'what if it was Nature all along' (Kirby, 2008), rather than man versus nature, then this changes the way we might think about anthropogenic practices, such as anthropogenic-induced climate change. As Kirby asks:

if the identity of 'the human' cannot be defined against Nature to secure its difference, then things will get decidedly strange. What happens to truth, scientific reference (for this is the most enduring puzzle that discussions about Nature must address), if it is in the nature of Nature to be political, perverse, contestatory – and to mutate accordingly? (Kirby, 2011: 98)

If the genealogy of 'our' climate change belongs to a much longer lineage of climatic changes, 'our' climate change both comes *after* many others and in part because of them. The corporeality of the human is a product of the chance inheritances of climatic changes, of earth revolutions, and climatic shifts, and so responsibility is not about being responsible for the entire world, but about understanding how humans are culturally and politically mobilized towards certain engaging materialities – namely, fossil fuels. That 'we' have a revolution of our own – anthropogenic climate change – is not some new genesis of man, but an inability to properly understand what it is that is inherited and how responsibility for that inheritance is configured, down the line, in blood, in atmosphere, and in minerality. The term that is used in climate science is 'interference', 'human interference in natural systems', as if humans were nature's outside, a kind of depraved voyeur of the Edenic scene. But, following Kirby, what if we saw this collapse as a way to keep the 'question of origins moving' (Kirby, 2011: 110)? Reconceptualizing the Anthropocene into new ordinary compositions of geologic life and formulations of geopolitics, which are adequate to the questions of geography that are at stake in these massive destratifications of the earth, might release the discovery of 'difference on the inside' (Kirby, 2011: 112), a corporeality of geology as power and politics. Such a rethinking of geopolitics is not just a question of redirecting the spheres and spaces of operation in ever more mineralogical ways through the states and thresholds of resources, but requires an overhaul, a going-under, into the corporeal and planetary processes of the geologic. Such a corporeal geology is surely necessary if we are to make less deadly destratifications. To author the Anthropocene as attributable to the agency of man misses the material specificity of what is at stake in the mobilization of fossil fuels and tells the same old anthropocentric stories of man and his dominion over nature.

3. The Anthropocene covers over *how* and *where* the geological is taken up. The use of fossil fuels is configured as a practice or behaviour, making it external to biological and social forms of reproduction. If we acknowledge

the geological as antecedent to the biological, or as a deposit of differentiation within the biological, then we get a very different subject of the Anthropocene. If the geological is understood as ontologically irreducible – an ontologically changeable context for being, that is often subducted into an understanding of the biological, but also before the biological (from where it draws its resources) – then the focus must be not on practices, but (in)corporeal affiliations. So, the matter under consideration – fossil fuels – is not outside of life: for most of us, it *is* life. But these geologic forces also proceed and exceed life. If we look at the massive population spike that is coupled with the beginning of the use of fossil fuels in the 1800s and the start of the Anthropocene, we populate as a collective biomass because of fossil fuels (that is not to say that this is not highly differentiated – on the contrary, bodies carry those inheritances of power and plays of energy through the body as openings or hungers). Fossil fuels cut and differentiate forms of life. So, there at least needs to be an acknowledgement of this *double birth* of fossil fuels and the body politic of the Anthropocene in the origin story, and an examination of what this material coupling means for the possibilities of a disavowing this inheritance.

This is not in any way to try and divert attention away from or disavow the vested interests that underpin the continued mobilization of fossil fuels, nor to suggest that attribution should not be sought. Rather, to try to come closer to understanding what a geologic corporeality might consist of, and how it might be understood as a contemporary condition of inequality. The false opposition of fossil fuels and pleasure in discourses of limits and prohibition fails to properly acknowledge the openings of these materialities and what they *give* (even before we are born) to the configuration of what life is. And, potentially, how these fossil gifts must become the site of another exchange – a gift that opens up possibilities for pleasure, for expansion and energetic expenditure – if we are to move against the proffered ending of the Anthropocene.

4. The universalizing impetus of the Anthropocene appeals to an ethics of sameness that erodes an appreciation of difference in fossil fuel intensities or what I am calling ‘geologic life’ (Yusoff, 2013a). This differentiation is important for responsibility and mitigation and pacifies the unequal development in habits, incorporations and expenditure of fossil fuels (we only have to think here of differences in fuel rich and poor, and what this means for life expectancy, to see that a geologically-levelled ground is ethically problematic, or the way in which the ‘silver bullet’ of population control is being located in women’s bodies in the Global South). This differentiation is also important for releasing other minor histories in the social processes

of power, sexuality, race, from the stifling utility of linear universalizing history. The question becomes how to understand the *shifting and specific determinations of fossil fuels* (and of the geologic more generally) without sacrificing the politics of difference and the specificity of political economies of fossil fuels; to allow fossil fuels their nonlocal origination without sacrificing their specificity in economies of extraction, affect and propagation. The geologic is resident as both common heritage (it is irreducible), and uncommon heritage (with distinct intensities and inheritances that differentiate communities).

So, to tell a story about the origins of fossil fuels and their genealogy does not require a planetary sense – a geological levelling of the ground in the ‘we’ of mankind – but, instead, requires ‘a transformation of one’s heritage worthy of the name’ (Diprose, 2006: 437). Such a name must speak to both the privilege of those gifts and their sacrificing of the future beyond that privilege. It must be an ‘active intervention’ that extends beyond that inheritance, because it will never, according to Derrida, be generous enough to the untimely gifts of that inheritance (Diprose, 2002). Only by refusing the gifts of our inheritance, as privileged ‘coal-fired’ people, can the lineage of a fossil-fuelled corporeality be broken (and this needs a tectonic social shift rather than an individuated prescription). But, in doing so, it is impossible to do so entirely, as that would mean moving totally against ourselves, for most of us (although not all) are because of fossil fuels – we are born through their gifts and into their (im)material configurations. This is why a behavioural or a practice-based approach, so favoured by sustainability literatures, will not do, because it refuses too much in terms of the prohibition of fossil fuels, without acknowledging what is already given in terms of genealogy. As long as fossil fuels remain a punitive arena for social judgement, but not punitive enough (in the right places, that is . . .), this energetic materiality remains immune from an intervention that touches being (and how the organisation of being is already configured towards fossil fuels) and thus being responsible to futures-to-come.

5. What is considered as axiomatic of the recognition of humanity *and* its impact on the earth is actually recognition only for the one, installing an archaeology of the human that is continuous within a single duration and geography. It is the reproduction of the self-same. The Anthropocene relies on a certain notion of the ‘human’ as collective under the sign of man. This ‘we’ of species-being and belonging presumes an uncomplicated and undifferentiated inheritance.
6. The Anthropocene contains within it a form of *anthropogenesis* – a new origin and ending story for man. It is a genesis that names man as the originator of a new geologic nature. Operating at the scale of the planet, global geography is claimed by man through the conversion of condensed solar power from the Carboniferous into actualized power in the Anthropocene. What this action of conversion actually unleashes is an

untimely geologic temporality: the Anthropocene *is* released *through* the Carboniferous, but that release is made through very particular arrangements of power. In this sense, what the Anthropocene marks is a temporal and geographic *destratification* of the earth's stratigraphic record (see Clark and Hird, 2014), as much as a stratification of humanity as a layer within it. The Anthropocene might name another strata in the earth's geologic record, one of many expired crusts of fleshy biosphere, but it actualizes a restratifying operation, rewriting the force of 'life' through the sediments of nonorganic matter to instigate new stratas of (human and nonhuman) extinction. Through this material recombination, the geologic is made explicitly part of contemporary corporeality, but it also exacts historical tears in geological ordering, producing ontological rifts. There is a problem in terms of ontology when we try to think the imbrication of the biological and geological, because while the biological is evolutionary in character (characterized by modes of becoming and mutation), the geologic remains relatively inert in its stratifications until it is punctuated by geophysical events (this is not to say that weathering and erosion, folding and various movement of the earth's crust do not enact a kind of slow becoming, but this is very different in temporal expression to biological modes). Geology is characterized by an eventual return to the constitutive parts of minerality. So, thinking these two things together requires a multiple ontology that can hold contradicting states, temporalities, and 'bodies' of matter together while recognizing their differentiated spacing in the constitution of time.

7. The Anthropocene, in the spectre of the human-as-strata-to-come, offers a *waiting materialism*, not as reservoir but as the immanent potential of a material actuality that is inseparable from the 'play of structures' that constitute the notion of geologic time as human time.⁸ In this sense, the spectre of the anthropogenic trace foreshadows the archaeology of the human, and it *installs* a coming geologic materiality into the human that proclaims its end.
8. If the slogan were *The Carboniferous Lives Again!* instead of *Welcome to the Anthropocene!*, would the secondary power of that initial fossilization event become apparent? As Steffen et al. point out, fossil fuels are a subsidy from the Carboniferous, giving energy from the deep past to contemporary society.⁹ If we acknowledged this energetic subsidy as lending of not just materials but capacities for the geologic within hominid corporeality, then the location of agentic power shifts. When we understand our being is mineralogical as well as biological, and that we already *possess a capacity for the geologic*, then the specific constellations of *where* and *how* we locate responsibility changes. Then, the kinds of temporal constellations between the burning of intensified 345 million-year-old solar matter-energy in the present, for the future-to-come, comes to matter. If geology is sensible of itself in so much as it has an ordering logic, if it is articulate in its stratifications, reading pebbles, rocks, various kinds of matter, sorting, organizing (Roger Caillois calls this agency 'computational'), folding, compacting the biological slime of the earth into its various layers, there can be no human that is other to these forces, because the

human is an expression of the various constellations of this minerality. There is no telos or origins to this experimentation and mutation – it is just that. This is not the same as subsuming nature into man, and making nature subject to man's telos. No epoch is properly contemporary with itself. Thus the epoch contains within it a radically inhuman quality that pushes thought beyond the confines of a lived body and into the reaches of inhuman temporalities. In terms of accounting for the passage of 'life', the Anthropocene instigates a new moment for human history *and* for the 'life' of the subject beyond subjectivity. As human history gives way to geologic horizons, the matter of human subjectivity must change and reach beyond life and the organism to think its way through the stratified layers of the earth's formation. It must abandon its anthropogenesis – in order, ironically, that it can say something about how to live beyond the material erasure of the Holocene.

9. If we understand that the etiology of subject formation involves nonhuman and inhuman elements (that are local and nonlocal), which, for the most part, remain an unacknowledged substratum in human becoming, there are broader questions to answer about the nature of inhuman determination and its activation within notions of human agency (vigilant to how that determination is theorized in light of the politics of environmental determinism). If we thought about geological life as both individuated and a cross-current of agential earth forces, life as nothing more or less than the spacing between minerality, and its composition of power and flows. What if, following Kirby, we began to think of "agency" as a fractured force whose *immotivations* are also determined, such that thinghood may resonate with anthropic intention' (Kirby, 2011: 232), rather than assuming that culture is rivalling nature? If anthropic intention was understood as resonating with geomorphic forces, in collaboration rather than mastery, then these alliances become open to scrutiny. If corporeality is 'what a body is and what a body can do' (Kirby, 1991: 4), a collective body can only be a geomorphic force if it can possess and incorporate geologic forces as intemperate within life. If the implicit point of the Anthropocene thesis is to stop being a geomorphic force that is forcing various other planetary flows beyond their 'limits', then a sensibility of how bodies are *towards* geologic materials is needed. Yet in a century of biology, there is a missing language for geologic life as corporeal rather than planetary; as constitutive of subjectivity as well as worlds. The genetic and genealogical inheritance of fossil fuels has indeterminate locations when we are used to thinking bodies as biological systems, but not bodies as earth systems. Geology only enters the scene of life¹⁰ as an agent of arrest and calcification rather than liquidity, and so there is a need for modes of sensibility around the geologic¹¹ as a mode of subjectification that is attuned to certain intensities of fossil fuel usage and not others. The cultivation of this geologic sensibility is an aesthetic ethico-political task.
10. As a narrative of imagined endings, the Anthropocene brings to the surface questions of origins (under what conditions was this human made? how and where did this human begin? what geopowers does it need to survive?).

Everything that is found in the end must also be found in the origin for the concept to be coherent. As Elizabeth Grosz says: 'In other words, an origin never could infect an end unless it wasn't simply or even an origin, and an end is always implicated in the origin that it ends' (Grosz, 2003: 142). Origin stories are always mythic because they posit a beginning of time that is outside of itself, in the sense that it is a monotime that is outside of the flux and continuance of change – outside, as it were, the passage of time.¹² An origin is presented as a location that is immutable to the narrative that it begets, and thus it can only collapse when the concept it carries collapses too. There is no going back before it, so any proto or posthumanist account that wants to move beyond Holocene humanism must attend to its origin stories.

Roslyn Diprose alerts us to the need to be vigilant about what it is we inherit, even as we are always partially blind to the full knowledge of that inheritance. It is our responsibility to be gracious in light of this knowledge or lack of knowledge, and to accept how we are tied to what the future becomes (Blanchot 1997, 101). Geologic corporeality is something that is inherited; it is before us and immanent within the condition of our being. If there is a response to be made to our fossil fuelled-being, it must acknowledge this condition, and seek to question its geosocial reproduction. As Diprose argues:

First, it is not enough to blindly reaffirm the heritage one embodies, which is, in part, what happens in any action, decision, or thought; here Derrida suggests that one must know as much as possible what one is reaffirming and how to reaffirm it. (Diprose, 2006: 437)

To know as much as possible means to know not just the prohibitions of inheritance – what it teaches us *not to do*, how it teaches us not to live – but it also requires us to know the gifts of inheritance, what it has *allowed*, and what it has *given*, and how these might be equally deadly to the future-to-come. Diprose suggests that what is needed is:

A transformation that keeps alive the unforeseeable future-to-come. This requires 'active intervention' in any such reaffirmation of one's heritage, especially a rigorous critique of the concepts one has inherited, and hence self-critique. (Diprose, 2006: 437)

Yet, if this inheritance remains obscure within the very corporeality that carries it (as the geological does), then such refusals or interventions cannot be made. Only by learning to know and sense ourselves *as* geological (and accepting that this knowledge will never be complete), and as a being that is *toward* the geological, can we hope to move against coal-fired inheritances that burn 'at the expense of the future' (Nietzsche in Diprose, 2006: 438). Fossil fuels are a material context that has shaped corporeality,¹³ not just

for those who have partaken of their gifts, but for the people to come that have been transformed by the conversion of that matter-energy.¹⁴ Gifts need to be acknowledged rather than disavowed.

The Anthropocene is then between times – it is neither the Holocene, nor quite something else; and if the Anthropocene is something we can diagnose in the present it is also something that is ceasing to be; that is, there is an unconfined element that is only just on the cusp of understanding and awaiting a new language to be forged (that must at the same time decolonize the language that carries it). It is both continuous with, and a tear in, the fabric of time. So, there is a change of epoch in terms of history and in terms of sense, of the sensibility of the subject: of its intensive inhuman elements and extensive location within geology. Such an interruption and development of a language of geologic sensibility is the pre-political condition of a politics of social change. If the Anthropocene is an opportunity, as badly named as it is, to think about forms of geologic inscription within a larger field of geologic forces, then we might turn away from the monumental – man as the authoring centre – in favour of a more exacting science of attribution that speaks to the interiorities and differences that diffract through our geologic lives. Then, the Anthropocene might finally, at last, move against its universalizing legacy of a supra-historical deployment of teleologies and search for origins (and its deadly inheritance to a ‘coal-fired people’) to embrace more diversely calibrated futures (attentive to a genealogic debt; the geopowers that are inscribed in the body). The Anthropocene installs an origin and end – anthropogenesis – into the history of rocks (geology), which is characterized by continuous temporal conservation and propagation of life forms, with no beginning, nor end. This anthropogenesis erases the unceasing stratification of human life by geology, the geomorphicity of geologic forces. It represents an anthropomorphizing of the rocks rather than a geologizing of them, in which geologic succession is turned into authorial submission. To geontologize would require a remembrance of the domestication of minerals that lay social stratum upon stratum and insensible matter upon sensible flesh, writing a geomorphic passage into the body, in signatures of stone.

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Notes

1. I use the term 'man' as it is used in Anthropocene literatures as an uncritical unifying patriarchal term for the human species without an understanding of sexual difference and the continued gendered production of knowledge.
2. Caillois suggests that: 'Life appears: a complex dampness, destined to an intricate future and charged with secret virtues, capable of challenge and creation. A kind of precarious slime, of surface mildew, in which a ferment is already working. A turbulent, spasmodic sap, a presage and expectation of a new way of being, breaking with mineral perpetuity and boldly exchanging it for the doubtful privilege of being able to tremble, decay, and multiply' (Caillois, 1985: 105–6).
3. The Anthropocene contains a humanist and inhumanist moment, but some care is needed in the understanding of the inhuman as distinct from the use of the inhuman as a form of dehumanizing in humanist discourse (which may well be the strength of humanist thought).
4. A world of geologic expenditure is a world in which the energy of fossil fuels has full energetic play, torn away from utility.
5. Foucault comments that genealogy is a project that 'rejects the metahistorical deployment of ideal significations and indefinite teleologies. It opposes itself to the search for "origins"' (Foucault, 1984: 77).
6. What is being proposed in the designation of the Anthropocene by Crutzen is not actually originary in some respects, as much as the instigation of a threshold effect: the naming of a crossing from one state to another. Moving from the Holocene to the Anthropocene is leaving behind an idea of environmental stability, crossing a threshold into a more contingent chaotic state. In one sense, all that the authors promoting the designation of the Anthropocene are saying is: 'this is serious. . . this is a geophysical revolution' (but where is the revolution?). While the Anthropocene seems to solidify, to make fossils of us all, it is really about a rupture of the 'agreement' between the biophysical and social organisation of life. It is disordered time (because it is a destratification of geologic time). It is outside science (because it is of the earth), and it is only quasi-legible (because it is a new order of time).
7. The authors approvingly quote Vladimir Vernadsky, who also used the term Anthropocene, writing about 80 years ago to talk about the transformation of the earth. He suggested: 'We are confronted with a new form of biogenic migration resulting from the activity of the human reason' (Vernadsky in Crutzen and Steffen, 2003: 254). He called this the noösphere and suggested in 1943 that: 'The noösphere is a new geological phenomenon on our planet. In it, for the first time, man becomes a *large-scale geological force*. He can, and must, rebuild the province of his life by his work and thought, rebuild it radically in comparison with the past. Wider and wider creative possibilities open before him' (Vernadsky, 2005: 20).
8. Deleuze and Guattari suggest: 'Genesis, like time, goes from the virtual to the actual, from structure to its actualisation; the two notions multiple internal time and static original genesis are in this sense inseparable from the play of structures' (Deleuze and Guattari, 2004: 180).
9. All fossil fuel energy is solar powered, a subsidy from the Carboniferous: 'Fossil fuel use offered access to carbon stored from millions of years of

photosynthesis: a massive energy subsidy from the deep past to modern society, upon which a great deal of our modern wealth depends' (Steffen et al., 2007: 615–16). Yet, the conceptualization of fossil fuels rarely acknowledges the solar and plant basis of these energy conversions and their differentiated inhuman origins. We do not hear: 'I eat fossil fuels', 'I metabolize the Carboniferous'; the question still remains, in Derrida's terms, how to eat well with fossil fuels.

10. Fossil fuels have within them what Claire Colebrook calls a 'passive vitalism', a waiting life or life in abeyance.
11. De Landa says: 'There is a sense, then, in which we are all inhabited by processes of nonorganic life. We carry in our bodies a multiplicity of self organizing processes of a definite physical and mathematical nature—a set of birurcations and attractors that could be determine empirically, at least in principle. Yet, is there any way to experience this nonorganic life traversing us (for example, through the use of meditation techniques or psychedelic chemicals to "destratify" ourselves)? As noted above, there is a "wisdom of the rocks" from which we can derive an ethics involving the notion that, ultimately, we too are flows of matter and energy (sunlight, oxygen, water, protein and so on). At any moment in these flows, we can distinguish some portions that are more viscous (hardened, stratified) than others. An ethics of everyday life, in these terms, would involve finding the relative viscosities of our flows, and giving some fluidity to hardened habits and making some fleeting ideas more viscous—in short, finding, through experimentation, the "right" consistency for our flows (the "right" mixture of rigid structures, supple structures and self organizing processes)' (De Landa 1992, 153).
12. The beginning of time that the origin installs presupposes the possibility of an end of time in so much as if there is a point at which things begin, then there can also be a point at which they end. If there is no origin as such, then there is no proposition of finitude, only differentiated forms of becoming and extinction.
13. The human epoch misses the point of how our current intra-corporeality is tied to fossil fuels, *how it is because of their materiality* and what this *lends* to geopolitical power structures, rather than this power as something mythic that originates with the human. Humans may have devised ever more ingenious ways to excavate and convert fossil fuels, but they have yet to generate an equivalent materiality that is not indebted to the extraordinary capabilities of the Carboniferous. How could we live without these things upon which our body depends to be a body? It no less depends on fossil fuels than it does on water or sun. Fossil fuels configure the internal and social asymmetries of our bodies, the type, speed and geography of our worlds, as well as the configurations of our desires and how we pose our questions. Yet, only part of this minerality is *given* for reconfiguration in most accounts.
14. Fossil fuels are *in/of* the blood, as inheritance (as antecedent materiality and as waiting materialism) and as corporeal matter that has certain determining claims on agency. Given the legacy of imperial histories, such acknowledgements of inorganic determinacy are problematic, but to shy away from them is equally so.

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