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# The geology of mankind? A critique of the Anthropocene narrative

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## Abstract

The Anthropocene narrative portrays humanity as a species ascending to power over the rest of the Earth System. In the crucial field of climate change, this entails the attribution of fossil fuel combustion to properties acquired during human evolution, notably the ability to manipulate fire. But the fossil economy was not created nor is it upheld by humankind in general. This intervention questions the use of the species category in the Anthropocene narrative and argues that it is analytically flawed, as well as inimical to action. Intra-species inequalities are part and parcel of the current ecological crisis and cannot be ignored in attempts to understand it.

## Keywords

Anthropocene, inequality, society

Since Nobel laureate Paul Crutzen (2002) proposed ‘the Anthropocene’ as a new geological epoch in his short piece ‘The geology of mankind’ in *Nature* in 2002, the concept has enjoyed a truly meteoric career. The currently unfolding discourse on the Anthropocene represents a convergence of Earth System natural science and post-Cartesian<sup>1</sup> social science as represented, for instance, by Bruno Latour. Both fields suggest that the Enlightenment distinction between Nature and Society is obsolete. Now that humanity is recognised as a geological force, the story goes, we must reconceptualize not only the relations between natural and social sciences but also history, modernity and the very idea of the human.<sup>2</sup> Indeed, the increasingly inextricable interfusion of nature and human society is incontrovertible, as evidenced not only by climate change but also by other kinds of anthropogenic transformations of ecosystems.

The question we wish to address in this brief intervention is whether this should really prompt us to abandon the fundamental concerns of social science, which importantly include the theorization of culture and power. We shall suggest that the physical mixing of nature and society does not

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warrant the abandonment of their *analytical* distinction. Rather, precisely this increasing recognition of the potency of social relations of power to transform the very conditions of human existence should justify a more profound engagement with social and cultural theory. We find it deeply paradoxical and disturbing that the growing acknowledgement of the impact of societal forces on the biosphere should be couched in terms of a narrative so completely dominated by natural science. Moreover, in line with the abandonment of Cartesian dualism in our approach to the material conditions of human existence, we have no less reason to reconsider human economies and technologies as similarly hybrid phenomena interlacing biophysical resources, cultural perceptions and global power structures.

According to the standard Anthropocene narrative, the Industrial Revolution marks the onset of large-scale human modification of the Earth System, primarily in the form of climate change, the most salient and perilous transgression of Holocene parameters. More precisely, in his 2002 piece, Crutzen suggested that James Watt's invention of the steam-engine inaugurated the new epoch, and the chronology stuck: in the burgeoning literature on the Anthropocene, the steam-engine is often referred to as the one artefact that unlocked the potentials of fossil energy and thereby catapulted the human species to full-spectrum dominance (e.g. Alberts, 2011: 6; Beerling, 2007: 8; Berners-Lee and Clark, 2013: 8–10; Irwin, 2010: 1; Lynas, 2011: 21; Robin and Steffen, 2007: 1699; Sayre, 2012: 58; Steffen et al., 2011: 844–845).

Theorists of the epoch have little to say about the actual causes of the rise of steam, but they do propound a general framework for understanding the transition to fossil fuels in the Industrial Revolution, which, for reasons of logical necessity, is deduced from human nature. If the dynamics were of a more contingent character, the narrative of an entire species – the *anthropos* as such – ascending to biospheric supremacy would be difficult to uphold: ‘the geology of mankind’ must have its roots in the properties of that being. Anything less would make it a geology of some smaller entity, perhaps some subset of *Homo sapiens*. Even when the Anthropocene is dated to the time of Watt – and not to the rise of agricultural civilisations, as in the ‘early Anthropocene’ hypothesis (e.g. Ruddiman, 2003; Smith and Zeder, 2013) – the fuse is often traced back into the mists of time, lit in the early evolution of the human species.

A key component of the Anthropocene narrative is thus the manipulation of fire: the path to the fossil economy was laid down when our hominid ancestors once upon a time learned to control fire. Here was ‘the essential evolutionary trigger for the Anthropocene’, in the words of Rapuach and Canadell: fossil fuel combustion is result of the fact that ‘long before the industrial era, a particular primate species learned how to tap the energy reserves stored in detrital carbon’ (Rapuach and Canadell, 2010: 210–211). Or, in the words of Will Steffen, Paul J Crutzen and John R McNeill: ‘The mastery of fire by our ancestors provided humankind with a powerful monopolistic tool unavailable to other species, *that put us firmly on the long path towards the Anthropocene*’ (Steffen et al., 2007: 614, emphasis added; cf. Clark, 2012; Crosby, 2006; Steffen et al., 2011: 846). In this narrative, the fossil economy is the creation precisely of humankind, or ‘the fire-ape, *Homo pyrophilis*’, as in Mark Lynas’ popularisation of Anthropocene thinking, aptly titled *The God Species* (Lynas, 2011).

A scrutiny of the transition to fossil fuels in 19th-century Britain (Malm, 2013a), however, reveals the extent to which the historical origins of anthropogenic climate change were predicated on highly inequitable global processes from the start (cf. Frank, 1998; Pomeranz, 2000). The rationale for investing in steam technology at this time was geared to the opportunities provided by the constellation of a largely depopulated New World, Afro-American slavery, the exploitation of British labour in factories and mines, and the global demand for inexpensive cotton cloth. Steam-engines were not adopted by some natural-born deputies of the human species: by the nature of the

social order of things, they could only be installed by the owners of the means of production. A tiny minority even in Britain, this class of people comprised an infinitesimal fraction of the population of *Homo sapiens* in the early 19th century. Indeed, a clique of white British men literally pointed steam-power as a weapon – on sea and land, boats and rails – against the best part of humankind, from the Niger delta to the Yangzi delta, the Levant to Latin America (cf. Headrick, 1981, 2010). Capitalists in a small corner of the Western world invested in steam, laying the foundation stone for the fossil economy: at no moment did the species vote for it either with feet or ballots, or march in mechanical unison, or exercise any sort of shared authority over its own destiny and that of the Earth System.<sup>3</sup>

The ability to manipulate fire was, of course, a necessary condition for the commencement of fossil fuel burning in Britain. So were tool-use, language, co-operative labour and a whole range of other human faculties – but they were *trivial* necessary conditions, lacking correlation with the outcome of interest. The error here is well-covered in historiographical textbooks. To invoke ultra-remote causes of this kind ‘is like explaining the success of the Japanese fighter pilots in terms of the fact that prehumans evolved binocular vision and opposable thumbs. We expect the causes we cite to connect rather more directly to consequences’, or else we disregard them, as pointed out by John Lewis Gaddis (Gaddis, 2002: 96; cf. Bloch, 1992: 158–159). Attempts to attribute climate change to the nature of the human species appear doomed to this sort of vacuity. Put differently, transhistorical – particularly species-wide – drivers cannot be invoked to explain a qualitatively novel order in history, such as mechanized, steam-power production of commodities for export to the world-market.

How about later stages of the fossil economy? The succession of energy technologies following steam – electricity, the internal combustion engine, the petroleum complex: cars, tankers, aviation – have all been introduced through investment decisions, sometimes with crucial input from certain governments but rarely through democratic deliberation. The privilege of instigating new rounds appears to have stayed with the class ruling commodity production. Reflecting an intra-species concentration on another level, as of 2008, the advanced capitalist countries or the ‘North’ composed 18.8% of the world population, but were responsible for 72.7 of the CO<sub>2</sub> emitted since 1850, subnational inequalities uncounted. In the early 21st century, the poorest 45% of the human population accounted for 7% of emissions, while the richest 7% produced 50%; a single average US citizen – national class divisions again disregarded – emitted as much as upwards of 500 citizens of Ethiopia, Chad, Afghanistan, Mali, Cambodia or Burundi (Roberts and Parks, 2007). Are these basic facts reconcilable with a view of *humankind* as the new geological agent?

We would argue that, to the contrary, uneven distribution is a condition for *the very existence* of modern, fossil-fuel technology (Hornborg, 2001, 2011). The affluence of high-tech modernity cannot possibly be universalized – become an asset of the species – because it is predicated on a global division of labour that is geared precisely to abysmal price and wage differences between populations. The density of distribution of technologies that are ultimately dependent on fossil fuels by and large coincides with that of purchasing power. These technologies are an index of capital accumulation, privileged resource consumption, and the displacement of both work and environmental loads. After more than 200 years, we still tend to imagine ‘technological progress’ as nothing but the magic wand of ingenuity which, with no necessary political or moral implications elsewhere, will solve our local problems of sustainability. But globalized technological systems essentially represent an unequal exchange of embodied labour and land in the world-system. The world-view of modern economics, the emergence of which accompanied the Industrial Revolution in the hub of the British Empire, systematically obscures the asymmetric exchange of biophysical resources on which industrialization rests. This disjunction between exchange values and physics

is as much a condition for modern technology as engineering. The uneven accumulation of technomass visible on satellite photos of night-time lights proceeds by means of a simple algorithm: the more fossil fuels and other resources capital has dissipated today, the more it will afford to dissipate tomorrow. Perceptions of ‘technology’, no less than perceptions of ‘Nature’, are cultural constructions conditioned by global power structures: the promises of fossil-fuelled technology to humankind were illusory all along. Our narratives of this destructive force should not replicate those illusions.

The best counter-shot for the Anthropocene narrative seems to be population growth: if it can be shown that fossil fuel combustion is largely fanned by the multiplication of human numbers, the species can indeed be held causally responsible. Thus the leading Anthropocene theorists like to foreground this as one or even *the* major perturbation of the biosphere (e.g. Crutzen, 2002, 2006: 14; Steffen et al., 2007: 618; Zalasiewicz et al., 2008: 4, 2010: 2228–2229). Granted, there is a correlation between human population and CO<sub>2</sub> emissions, but the latter increased by a factor of 654.8 between 1820 and 2010 (Boden et al., 2013), while the former ‘only’ did so by a factor of 6.6 (Maddison, 2006: 241; United Nations, 2011), indicating that another, far more powerful engine must have driven the fires. For recent decades, the correlation has been revealed as outright negative. David Satterthwaite juxtaposed rates of population growth to rates of emissions growth in the quarter-century between 1980 and 2005, and found that numbers tended to rise fastest where emissions grew slowest, and vice versa (Satterthwaite, 2009). The rise of population and the rise of emissions were disconnected from each other, the one mostly happening in places where the other did not – and if a correlation is negative, causation is out of the question.

A significant chunk of humanity is not party to the fossil economy at all: hundreds of millions rely on charcoal, firewood or organic waste such as dung for all domestic purposes. Satterthwaite concluded that one-sixth of the human population ‘best not be included in allocations of responsibility for GHG emissions’ (Satterthwaite, 2009: 547–550). Their contribution is close to zero. Moreover, 2 billion people, or nearly one-third of humanity, have no access to electricity, and so, in the words of Vaclav Smil, ‘the difference in modern energy consumption between a subsistence pastoralist in the Sahel and an average Canadian may easily be larger than 1,000-fold’ (Smil, 2008: 259). Depending on the circumstances in which a specimen of *Homo sapiens* is born, then, her imprint on the atmosphere may vary by a factor of more than 1000 (Satterthwaite, 2009: 564). Given these enormous variations – in space and in time: the present and the past – humanity seems far too slender an abstraction to carry the burden of causality.

Now, proponents of the Anthropocene might object that from the standpoint of all other living things, and indeed from the biosphere as a whole, what really matters is that climatic disruption originates from *within* the human species, even if not *all* of it is to blame, and so a species-based term for the new geological epoch is warranted. A Tuareg pastoralist or a Toronto paymaster, the burner of fossil fuels is, after all, *human*. This seems to be a compelling argument, providing the Anthropocene concept with a rather solid rationale. It is indicative of the term’s origins in the natural sciences, geologists, meteorologists, biologists and others having detected an overwhelming human influence on ecosystems, now ranged alongside natural selection, solar radiation and volcanic activity. The ‘Anthropocene’ registers this moment of epiphany: the power to shape planetary climate has passed from nature into the realm of humans.

As soon as this is recognised, however, the main paradox of the narrative, if not of the concept as such, becomes visible: climate change is *denaturalised* in one moment – relocated from the sphere of natural causes to that of human activities – only to be *renaturalised* in the next, when derived from an innate human trait, such as the ability to control fire. Not nature, but human nature – this is the Anthropocene displacement. It backs away from the vertiginous depth of

perhaps the most ground-breaking scientific discovery of our time, which tells us that human beings have caused global warming over the course of their *history*. This kind of history does not appear in the biography of any other species: beavers and bonobos continue to construct their own micro-environments as they always have, generation upon familiar generation, while a certain human community may burn wood for ten millennia straight and then coal the next century. Realising that climate change is ‘anthropogenic’ is really to appreciate that it is *sociogenic*.<sup>4</sup> It has arisen as a result of temporally fluid social relations as they materialise through the rest of nature, and once this ontological insight – implicit in the science of climate change – is truly taken onboard, one can no longer treat humankind as merely a species-being determined by its biological evolution. Nor can one write off divisions between human beings as immaterial to the broader picture, for such divisions have been an integral part of fossil fuel combustion in the first place (Hornborg, 2001, 2011).

Following climate science out of nature, we should dare to probe the depths of social history: not relapse into the false certitude of another natural inevitability. The Anthropocene narrative could here be seen as an illogical and ultimately self-defeating foray of the natural science community – responsible for the original discovery of climate change – into the domain of human affairs. Geologists, meteorologists and their colleagues are not necessarily well-equipped to study the sort of things that take place between humans (and perforce between them and the rest of nature), the composition of a rock or the pattern of a jet stream being rather different from such phenomena as world-views, property and power. Now that the latter layers of earthly existence mould the former, some epistemological confusion is perhaps to be expected. Against this background, ‘the Anthropocene’ resembles an attempt to conceptually traverse the gap between the natural and the social – already thoroughly fused in reality – through the construction of a bridge from one side only, leading the traffic, as it were, in a direction opposite to the actual process: in climate change, social relations determine natural conditions; in Anthropocene thinking, natural scientists extend their world-views to society.

Needless to say, this re-naturalisation of climate change is as much (if not more) a product of behaviour in the social sciences and humanities, namely the late awakening to a warming world. The baton has failed to pass between ‘the two cultures’, and now that the latter is slowly catching up, ‘the Anthropocene’ is already an entrenched concept and mode of thinking. Regrettably, many a social scientist and humanist has swallowed it lock, stock and barrel, oblivious to its anti-social tendencies, attracted by the idea of the *anthropos* as centre and master of the universe (be it productive or destructive), which speaks to certain humanist sensibilities (e.g. Alberts, 2011; Palsson et al., 2013; Szerszynski, 2012).

Perhaps the most important interventions from critical theory into the Anthropocene debate has been made by Dipesh Chakrabarty, who, in his essay ‘The climate of history: Four theses’, reflects on some of the pitfalls of species-thinking, but ends up endorsing it as a necessary project (Chakrabarty, 2009). Humanity really is constituted as a universal species agent that ‘flashes up in the moment of the danger that is climate change’, most starkly in the extreme weather events emblematic of the new epoch: ‘Unlike in the crises of capitalism, there are no lifeboats here for the rich and the privileged (witness the drought in Australia or recent fires in the wealthy neighborhoods of California)’ (Chakrabarty, 2009: 221). But this is a flawed argument. It blatantly overlooks the realities of differentiated vulnerability on all scales of human society: witness Katrina in black and white neighborhoods of New Orleans, or Sandy in Haiti and Manhattan, or sea level rise in Bangladesh and the Netherlands, or practically any other impact, direct or indirect, of climate change. For the foreseeable future – indeed, as long as there are human societies on Earth – there *will* be lifeboats for the rich and privileged. If climate change represents a form of apocalypse, it is

not universal, but uneven and combined: the species is as much an abstraction at the end of the line as at the source (cf. Malm, 2013b; Malm and Esmailian, 2012).

As for the drivers of climate change, naturalisation has an easily recognisable form. ‘Certain social relations appears as the *natural properties of things*’, to speak with Karl Marx: production is ‘encased in eternal natural laws independent of history, at which opportunity *bourgeois* relations are then quietly smuggled in as the inviolable natural laws on which society in the abstract is founded’ – or the human species in abstract (Marx, 1990: 1005, 1993: 87, emphases in original). The effect is to block off any prospect for change. If global warming is the outcome of the knowledge of how to light a fire, or some other property of the human species acquired in some distant stage of its evolution, how can we even imagine a dismantling of the fossil economy? Or: ‘the Anthropocene’ might be a useful concept and narrative for polar bears and amphibians and birds who want to know what species is wreaking such havoc on their habitats, but alas, they lack the capacity to scrutinise and stand up to human actions. Within the human kingdom, on the other hand, species-thinking on climate change is conducive to mystification and political paralysis. It cannot serve as a basis for challenging the vested interests of business-as-usual.

There is, however, a noteworthy difference between the bourgeois political economists Marx attacked and the Anthropocene narrative. Scholars naturalising climate change are rarely if ever working on behalf of the vested interests of business-as-usual. Most would likely wish to see them gone. Insofar as it occludes the historical origins of global warming and sinks the fossil economy into unalterable conditions, ‘the Anthropocene’ is an ideology more by default than by design, more the product of the dominance of natural science in the field of climate change and, perhaps, the general blunting of critical edges and narrowing of political horizons in the post-1989 world than of any malicious apologetics. It is not necessarily any less harmful for that. It is one of several theoretical frameworks which happen to be not only analytically defective, but also inimical to action.

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## Notes

1. By ‘post-Cartesian’, we mean approaches that abandon Cartesian distinctions such as between Society and Nature or between subject and object.
2. Programme for the conference ‘Thinking the Anthropocene’, Paris, 13–15 November 2013.
3. Nor is the Anthropocene narrative itself today conducive to democracy, but rather the opposite; cf. Leach (2013).
4. The neologism ‘sociogenic’ is, of course, means to indicate that the driving forces derive from a specific social structure, rather than a species-wide trait. Similarly, Richard Norgaard (2013) has recently suggested that we think in terms of the ‘Econocene’, in view of ‘the 50-fold increase and the globalization of economic activity during the 20th century’. Two other candidates worth consideration – both proposed to better integrate social and natural aspects – are the ‘Technocene’ and the ‘Capitalocene’.

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