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## **'Firepower' and Environmental Security in the Anthropocene**

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SIMON DALBY, MAR 1 2018

### **Climate Change and Environmental Politics**

Climate change is still widely understood as a global environmental problem in which greenhouse gases are a pollutant that has to be regulated and their use reduced mostly by technical policy actions. These policy options have mostly borrowed from the past, and in particular from arrangements such as the various measures to deal with chlorofluorocarbons (CFCs). It is noteworthy that the overarching Paris Agreement of December 2015 doesn't mention fossil fuels specifically. The current technocratic framework, which policy makers invoke, operates on the assumption that market mechanisms and government incentives, combined with more transparency in evaluating emissions will be enough to make the transition beyond carbon fuels (Falkner 2016). Given the scale of what needs to be done and the speed at which change is happening, this seems increasingly unlikely (Rockstrom et al. 2016). Earth system scientists are talking in terms of a new geological epoch, the Anthropocene, to emphasize the scale of contemporary transformations which have changed so much of the planet in recent centuries. We no longer live in the Holocene, the relatively stable climate period since the last ice age.

As Peter Dauvergne (2016) has argued so clearly recently, the environmentalism of the rich, focusing on narrow technical regulation of parts of the global production system hasn't been able to come to terms with either the violent historical legacy of colonization, nor the overall disruptions of the rapidly expanding global economy. Some of these trends have been aggravated by neoliberalism whereby environmental protection has been privatized, where individual safety whether through bottled water or air filters, is substituted for regulation of pollution at source, or the collective provision of such things as municipal water supplies (Szasz 2008). There is little indication that individual actions as consumers are close to adequate to grapple with accelerating climate change, much less effectively constrain its causes in the profligate combustion practices of the modern economy. Carbon taxes might turn out to be a practical policy measure although, so far, they are dwarfed in scale by government policies providing subsidies to fossil fuel producers (Coady et al. 2017).

Traditional environmental protection measures will help. But they alone are nowhere near enough to effectively tackle climate change in particular, and the larger Anthropocene transformations in general. Key social processes that have been derided by neoliberalism for a very long time, things like industrial planning and developmental state strategies to focus on key innovations, are now needed urgently as it gradually dawns on many decision makers that 'the market' is not our salvation (MacNeil 2018). The Anthropocene suggests that, in addition to the focus on greenhouse gases, land use issues and patterns of urbanization are key to the future configuration of the earth system. Current trends to increased inequality, and the ability of the rich and powerful to distance themselves from the consequences of their actions, and the rest of humanity, both by building vertically, and separating themselves from the effects of the infrastructures that make their high consumption lifestyles possible, are clearly part of the political problem (Graham 2016). Likewise attempts to stop human migration in an interconnected global economy are causing violence and disruption rather than facilitating the kind of movement and change that the Anthropocene requires (Jones 2016).

### **Combustion and Firepower**

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But much of this discussion doesn't engage with the key geophysical process at the heart of contemporary transformations. Humanity's uniqueness among living beings is to a very substantial degree a matter of our domestication of fire, which as climate change accelerates we now understand as a Faustian bargain. Fire is a shape shifter in Pyne's (2012) terms. It's a process that allows for numerous transformations that have facilitated the extension of human powers dramatically. From initial human uses of fire for warming, cooking and protection, we have extended control of fire to smelt metals and make building materials. Fire has long been a weapon of war. Gunpowder, and subsequently more sophisticated explosives use combustion to greatly enhance military capabilities.

Given that combustion is the key physical process, it's not much of a stretch to extend this sense of the term 'firepower' to the larger processes of modern control over many things. Boilers in the form of steam engines turned thermal into mechanical energy and produced trains and 'steamships'. Modernity has more recently further controlled fire much more precisely in internal combustion engines; diesel and gasoline literally drive the contemporary economy as well as provide the mobility for modern militaries. These related forms of 'firepower' are key to the contemporary global political economy and so taken for granted, they rarely get the attention that critical thinking about climate change and the Anthropocene requires.

Humanity has dramatically expanded the processes of combustion by adding fossil fuels, the hydrocarbons of earlier geological periods, into the fuel mix of the present (Malm 2015). Hence the key point is considering our present circumstances in terms of geological rather than merely environmental terms (Hamilton 2017). In doing so, we have dramatically supplemented the volcanic emission of carbon dioxide into the atmosphere and are effectively overwhelming ecological processes of carbon dioxide sequestration, and hence causing climate change as heating results. Humanity has, facilitated by its unique appropriation and use of processes of combustion, 'scaled up' its ecological niche, to the extent that it now is changing the whole biosphere and related parts of the lithosphere, hydrosphere, cryosphere and atmosphere too (Smith and Zeder 2013). Modernity is very much about a pyric transition in Pyne's (2012) terms, from the use of open fires to the ever more controlled and contained use of combustion in industrial processes and internal combustion engines. These processes have allowed the transformation of many aspects of the planetary system as landscapes are changed by the human use of fire (O'Connor et al 2011).

The control of the processes of combustion and the power this generates for humans who can use this has also been key to geopolitics in the last few centuries (Dalby 2017). The rise of industrial capitalism, the nineteenth century expansion of European empires and subsequently the extension of what came to be known as globalization was powered by a novel geological process where the rich and powerful turned rocks into air, reversing long term geological processes of carbon sequestration, to expand their power. Combustion is the key process in climate change; the sheer scale of our use of fire in its numerous forms has, through the production of prodigious amounts of carbon dioxide and other combustion products, now made humanity the major geophysical force determining the future climate of the planet.

## **Anthropocene or Capitalocene?**

Indirectly our firepower is facilitating large scale transformations of both terrestrial landscapes as well as life in the oceans, which, some historical research suggests may already have had dramatic, indirect effects on the course of human history (Bonneuil and Fressoz 2016). Colonization by Europeans was a key process in the transformation of the American landscape that may have had notable indirect political ramifications. This new geological period also involves constructing new landscapes and new ecologies based on artificial species mixes that have been dramatically changed by human movements over the last few centuries. Natural evolution no longer explains species distribution; this too is a key reason for naming the present in terms of human actions, hence the increasing use of the term Anthropocene.

Attempts to fix the 'blame' for the Anthropocene on capitalism, and on the rich and powerful (Malm and Hornborg 2014), and reduce the discussion to the degradation of late Holocene landscapes, frequently miss the larger significance of life as a productive force that repeatedly changes the planet. In focusing on the Capitalocene, the

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longer-term consequences of human wrought changes, of humanity as a geological scale agent, are in danger of being lost in a critique of globalization that hasn't sufficiently engaged with the earth system understandings of humanity as a geological scale transformation agent (Chakrabarty 2017).

The focus on capitalism, and it is important to emphasize the transformative effects of its expansion in European colonization prior to the large-scale use of fossil fuels in the industrial revolution (Moore 2015), relates to the more recent stages of human evolution and to what is now also discussed in terms of the emergence of a novel entity in the planetary system in terms of a 'technosphere' (Zalasiewicz et al. 2017; Donges et al. 2017). In the parlance of the earth system thinkers, the period since the Second World War, when petroleum powered mass consumption modes of human existence spread across the globe is the 'great acceleration' because of the speed and scale of the expansion of the economy (McNeill and Engelke 2016). What is at stake now in discussions of sustainability is the future shape of this 'technosphere' and whether it will overpower other geophysical forces in ways that so destabilize the earth system that it imperils human civilization in general, rather than just some parts of it that are especially vulnerable to disruptions in particular locales.

Which parts of humanity will determine the future of the planetary system, and how that gets decided, means that the Anthropocene is a profoundly political question. In Jeremy Davies' (2016, p. 16) terms "[S]truggles for advantage between living things are what politics deals with." Struggles for sustainability are about making that future into one that keeps the planet in something approximating the Holocene conditions that humanity has known. Earth system scientists often call this a 'safe operating space' within earth system boundaries, broadly similar to the remarkably stable conditions of the Holocene period of the last ten thousand years (Steffen et al. 2015). The alternative political choice, for such is what it is, is to ignore the earth system boundaries and continue the current effort to burn our way to perpetual prosperity, hoping that humanity will be able to adapt to continuous, uneven and largely unpredictable rapid changes as climate and other parameters of the system accelerate into new and unknowable configurations. The nightmare scenarios, if this fails, populate the pages of popular books and magazine articles, suggesting that a rapidly warming earth will lead to disasters of many kinds as humanity will be unable to cope with what is coming (see Wallace-Wells 2017).

Calls for earth system governance aimed at a 'sustainable' future usually operate on the assumption that such rapid climate change simply isn't compatible with human civilization in any recognizable form. Assuming this is an accurate prognosis, and there is no serious analysis of the earth system that doubts the broad strokes of this assessment, then the questions become, how to move beyond the pyric transition, or perhaps to a new stage in the transition, and further constrain and control combustion in ways that slow and eventually stop its by-products contributing to greenhouse gas build-up in the atmosphere. How to do so is the question for our times, both for social scientists, international relations scholars in particular, and political activists. For climate change deniers, fossil fuel advocates, and some elements of the Trump administration in the United States, these efforts are precisely what have to be prevented if their celebration of firepower, and the consumption it makes possible for their part of humanity, is to be maintained.

## **Environmental Security in the Anthropocene**

The Anthropocene formulation removes the widespread modern assumption of geographic and geological stability as the background to the human story. Moving from assumptions of a stable context that humanity is polluting, and replacing this with a focus on a dynamic earth that is being transformed by human action, also suggests that notions of resilience are not adequate frameworks for dealing with the large-scale changes that are already in motion. Resilience may help in many circumstances (Grove 2018) but it isn't enough to grapple with the biggest issues raised by the Anthropocene. Larger political and policy innovations for a world of perpetual adaptation will be needed, and soon (Kareiva and Fuller 2016). Likewise, simple assumptions that biofuels can replace fossil fuels in the global economy need to be subjected to more critical scrutiny focusing on the complete ecological framework of industrial agriculture (Kurthen and Wang 2016). 'No carbon' budgets will probably be essential to any serious effort to keep the planet within the 'safe operating space' (Rockstrom et al 2016). Numerous other similar devices will also be needed soon if the task of ending the fossil fuel era is to get the attention it urgently needs (Princen et al 2015). But this is all about much more than management and markets.

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Focusing on firepower as the heart of modernity makes it clear that a more fundamental reconsideration of present circumstances, a reimagining of humanity's place in the planetary system, and a focus on production, on what we are making and with what consequences, is necessary (Dalby 2017). Such 'planet politics' move us well beyond a focus only on the finer points of inter-state relationships and the conventional assumptions of international relations that assume a stable geographical context for the future (Burke et al. 2016; Fishel et al. 2018). Doing so inevitably troubles conventional formulations of policy and in particular challenges traditional understandings of security. Getting the key geophysical processes of combustion at the heart of climate change clearly in focus is essential to develop sustainability in ways that will, in the long run, keep the earth system in something analogous to the conditions humanity has known through history.

In posing questions of security in these terms, the implicit geographies of national security that structure much security discourse in the US and Europe have to be challenged directly (Buxton and Hayes, 2016; Hardt 2018). Developmentalist assumptions that more carbon-fueled modernity is the answer to social problems in, and potential threats from, peripheral places are no longer plausible as the basis for sustainable development. A broader understanding of the interconnectedness of things in a dynamic biosphere where a combustion powered technosphere is rapidly expanding is essential. So too security thinking has to incorporate notions of care for people and environments if it is to transcend the modern formulations based on the violence of firepower and the presuppositions of external threats to modernity as the given context (Harrington and Shearing 2017). Such rethinking of environmental security for the future isn't going to be easy, but keeping combustion and the transformative forces of firepower in the Anthropocene clearly in mind as what has to be tackled, is a necessary and now urgent beginning to appropriate politics and scholarship for a rapidly changing world.

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