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ARTICLE

Sustainability, feminist posthumanism and the unusual capacities of (post) humans

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ABSTRACT

Despite the current environmental crises of anthropogenic climate change and environmental degradation afflicting the world, dualisms of culture/nature, human/non-human and animate/inanimate sustain a perspective on 'the environment' in which the human and the cultural are privileged over the natural world and other species. Policies on 'sustainable development' are likewise predicated upon efforts to assure future human prosperity. Our objective in this paper is to establish an alternative, post-anthropocentric perspective on environmental sustainability. Drawing on feminist materialist scholarship supplies an ontology to critique humanist approaches, and establishes the foundation for a posthuman sociology of environment, in which (post)humans are an integral but not privileged element. We consider the implications of this perspective for both sustainability policy and 'climate justice'. A posthuman ontology leads to the conclusion – perhaps surprisingly, given the anthropogenic roots of current climate change – that some unusual human capacities are now essential to assure environmental potential.

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Introduction

Climate change, dramatic rises in species extinctions, and life-threatening levels of pollution mean that issues of environmental sustainability and sustainable development are centre stage in research and policy. In this paper, we explore the implications of a posthuman and materialist ontology of human/environment interaction for social research on sustainability and sustainable development policy. Specifically, we look beyond mainstream social theory, beyond mainstream Western philosophy even, to establish a materialist and 'posthuman' perspective on environment that cuts across nature/culture and human/non-human dualisms (van der Tuin and Dolphijn 2010, 156–158). This, we shall suggest, offers a radical but productive understanding of both 'environment' and environmental 'sustainability'[1] that affects sociological understanding of how to engage with the pressing environmental issues of climate change and sustainable development while also addressing environmental or climate justice (Schlosberg and Collins 2014).

Culture/nature dualism has supplied post-Enlightenment philosophers, scientists and social scientists with a neat way to set limits on the respective concerns of the social and natural sciences (Fox and Alldred, 2016; Barad 1996, 181; Braidotti 2013, 3; Meloni 2016). However, when exploring issues of embodiment, anthropogenic climate change, or the effects of the built environment on well-being, such a distinction becomes problematic (Lidskog and Waterton 2016, 399). Recent scholarship in both natural and social sciences suggests that the natural and cultural are intertwined (Landeker and Panofsky, 2013; Lockie 2012, 2; Meloni 2014; Walker 2005, 81), and that culture/nature dualism imposes a false division to understanding these complex processes (Barad 1996, 180; Latour 1993; Rice 2013, 257). Furthermore, nature/culture dualism in philosophy and social theory sidelines many non-Western ontologies that recognise humans as integral to 'environment' (Rosiek, Snyder, and Pratt 2019; Todd 2016) reinforcing Eurocentric and colonialist knowledge and perspectives concerning 'nature' (Braun 1997; Sundberg 2014, 33).

With these critiques in mind, we shall argue that sociological analysis of environment and environmental sustainability needs to overcome anthropocentric privileging of the human over the non-human (Haraway 1991, 11) – to develop a perspective on the environment that – rather than differentiating the realms of human and non-human – draws culture and nature into one affective assemblage.[2] Drawing upon feminist and materialist scholarship, we set out a 'posthuman' perspective that integrates what we shall term 'posthumans' fully within the environment, and consequently de-stabilises conventional notions of environmental sustainability. We offer a perspective on 'sustainable development' as ecological potential, independent – but at the same time inclusive – of (post)human capacities.

Sustainability, sociology, posthumanism

If, as feminist biologist and social theorist Donna Haraway has suggested, nature has long been culture's 'Other' (1992, 65), contemporary moves within sociology

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have sought to move beyond this dualism – toward a post-anthropocentric perspective on 'environment'.[3] Such a post-anthropocentric move is not a new perspective. Recent post-colonial theory has suggested that more-than-human perspectives in recent Western social theory recapitulate much earlier non-Western and indigenous ontologies. In these latter perspectives

> a multiplicity of beings cast as human and nonhuman – people, plants, animals, energies, technological objects – participate in the coproduction of socio-political collectives (Sundberg 2014, 33).

Such approaches offer the possibility for ethical reciprocity with non-human agents and a 'sense of responsibility to something more than human' (Rosiek, Snyder, and Pratt 2019, 12). Here we complement these indigenous ontologies with feminist materialist and posthuman scholarship, which argues for the affectivity or vitality of all matter (Bennett 2010; Braidotti 2013). We will suggest that these supply the basis for a posthumanist engagement that is transversal to culture/nature dualism, and unsettles conceptions of 'environment', of 'sustainability', of 'sustainable development', and indeed of 'human' itself. This sets the scene for a post-anthropocentric policy orientation that engages with the pressing environmental concerns of the present age: climate change and environmental degradation by human activities.

Issues of environment have been addressed variously by feminist materialist scholars. For Haraway (1992, 150), nature/culture dualism is grounded in colonialism and racism, patriarchy and sexism, and reflects a capitalist appropriation of nature for the exclusive benefit of human culture. Her feminist and materialist project explored the proliferation of technologies and associated scientific perspectives that increasingly impinge upon human bodies, with the cultural trope of the 'cyborg' as her locating hook (Haraway 1991). Just as cyborgs challenge nature/culture dualism, entities labelled as 'apes' and 'women' – she argues – also unsettle the 'evolutionary, technological and biological narratives' that fostered distinctions between 'the natural' and 'the human' (ibid: 2). Such entities transgress the leaky boundary between these domains, providing the means to reveal the continuities between humans and the rest of the material universe (ibid: 154). These transgressions, suggests, have the potential to tear down 'a Berlin Wall between the world of objects and the world of subjects', revealing that nature and culture are inextricably coterminous in all bodies (Haraway 1997, 270).

Haraway's work is a key influence upon Braidotti's (2006b, 2011, 2013, 2019) extended development of a materialist, feminist and posthuman philosophy and ethics of environment, which argues that human interests cannot be divorced from the interests of other living things and of the physical Earth. Braidotti (2013, 26) describes her posthuman approach as dialectically emergent from the humanisms and anti-humanisms to be found in social theory and the humanities. Humanism provided the anthropocentric challenge to religious authority that supplied the foundations for social and political changes including the French Revolution, first-wave feminism and the anti-slavery movement. However, Braidotti (2006a, 200, 2011, 82, 88–89) suggests that the 'human' who was the measure of all things turned out to be white, male, able-bodied and exploitative of all other life-forms. Anti-humanist theories rejected the anthropocentrism of humanism, and – most recently via post-structuralist theory – proclaimed the death of 'Man' as an intrinsically progressive force (Braidotti 2013, 23). The latter thereby supplied a crucible for 'alternative models of the human subject' that challenge the white, male, Western subject of humanism (ibid: 38).[4]

Despite these critical advances, Braidotti argues that anti-humanism risks throwing out the progressive achievements of humanism concerning solidarity, social justice and equality (2013, 29), and that it would be an ironic act of humanist hubris for humans to assert the end of humanism (2013, 30). While acknowledging the validity of the anti-humanist critique of humanism as a totalising conceptualisation, Braidotti (2013, 38, 45) offers instead a critical and affirmative 'posthuman' eco-philosophy that establishes a continuum between posthuman bodies and non-human matter (2013, 104) and between subjectivity and ecology (2006b, 41). This, in turn, constitutes an ethics based on a new sense of inter-connectedness between all matter: 'an affirmative bond that locates the subject in the flow of relations with multiple others' (2013, 50, see also Conty 2018, 91; Cudworth and Hobden 2015; Franklin 2006; Pickering 2005, 33–35).

Braidotti's materialist posthumanism embraces two shifts: from essentialism to relationality, and from (human) agency to material affectivity. On the move from essences to relationality, this 'new' materialism (Braidotti 2019, 45; Coole and Frost 2010; Cudworth and Hobden 2015) rejects notions of pre-existent, fixed entities such as bodies, animals, plants, bacteria, diseases, fossil fuels, atmospheric conditions, climates, coastlines, economic and political systems, consumers, motor vehicles or governments. Rather, these myriad materialities are relational, gaining form and continuity through their engagements with the other material relations with which they assemble, and through the emergent capacities or 'becomings' that they gain in these interactions (Deleuze 1988, 125; DeLanda 2006, 3). Events and interactions are considered as *assemblages* (Bennett 2005, 445; Pickering 2005, 34): arrangements or orderings (Buchanan 2017, 465) of relations (bodies, things, social institutions and constructs) that are inherently fluid and continually in flux (Deleuze 1988, 128; Lemke 2015).[5]

In place of human agency as the prime mover of social production, new materialists such as Braidotti and Jane Bennett proclaim the liveliness and affectivity of all matter; a 'thing-power' (Bennett 2010, 2) associated with all

materiality. In Bennett's view, human agency is itself a subset of thing-power, though a consequence of a human body's component materialities (bone, muscle, blood and so forth) rather than its motivation by an active soul or mind (ibid: 10). This perspective cuts across distinctions between human bodies and all the other stuff conventionally treated as the 'environment': all the disparate materialities that may assemble together within an event have capacities to affect – or to be affected by – other assembled relations (Braidotti 2019, 45–46; Deleuze 1988, 101).

These two aspects of materialist ontology supply our starting-point for new ways of thinking about nature and culture, for how we research the social and natural worlds, and as we shall show later, a new perspective upon sustainability and sustainable development. Feminist materialism affirms the commonalities and connectedness of all matter (Braidotti 2013, 50). This includes human bodies and other 'human' stuff such as thoughts, ideas, memories, aspirations that have capacities to materially affect are drawn into a single assemblage; 'social' stuff such as organisations and social formations; and all the 'natural' stuff that constitutes the physical world (van der Tuin and Dolphijn 2010). In this ontology, 'environment' is no longer simply the context for human agency, but the arena for the production of the entirety of both 'natural' and 'social' worlds. There is nothing beyond environment, and nothing (for instance, humans and their diverse cultures) excluded from it.

From 'sustainable development' to enabling ecological potential

Sustainability has been a contested concept in policy and scholarly circles (Braidotti 1994; Fleurbaey et al. 2014, 293; Lockie 2016; Ratner 2004), with a range of natural science, ecological, economic, political, social justice and other perspectives jostling over the interactions and conflicts between nature and culture. The associated concept of 'sustainable development' draws upon environmentalism, economics, political science and international relations (Pearce, Markandya, and Barbier 1989; Whitehead 2014, 260–261), and has been elevated to the status of a policy goal in fields including energy production and consumption, employment and housing (Dempsey et al. 2011; Griggs et al. 2013).

Many environmental policy statements on sustainable development have been founded upon humanist and anthropocentric sentiments. The 1987 *Report of the World Commission on Environment and Development* (the 'Brundtland Report') defined sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (Brundtland et al. 1987, 37). The subsequent UN *Millennium Ecosystem Assessment* considered the effects of ecosystem change upon human well-being, and how to the conserve and sustain ecosystems so they may 'continue to supply the services that underpin all aspects of human life' (World Health Organisation (WHO) 2005, ii).

This emphasis is recapitulated in more recent UN policy statements such as the *2030 Agenda for Sustainable Development*, which argues that economic growth, social justice and environmental protection are 'integrated and indivisible' goals (United Nations (UN) 2015, 1), while explicitly setting the eradication of poverty as the 'greatest global challenge' (ibid.). Environmental sustainability depends upon ending global poverty, improving access to education and basic services, ending social discrimination and exclusion, and enabling participation in decision-making (United Nations (UN) 2016: Goal 1). So, for example, eradicating poverty among indigent farmers will also eradicate the illegal logging that is contributing to climate change (Whitehead 2014, 259); education and clean water will enhance women's and girls' participation in the economy and polity, with knock-on effects for conserving natural resources.[6] Of the 17 goals set out in the *Agenda* (see Figure 1), 13 focused upon the quality of human life, while only three (on climate action, and conserving marine and terrestrial wildlife) address the non-human environment (United Nations (UN) 2016).

1. No poverty
2. Zero hunger
3. Good health and well-being
4. Quality education
5. Gender equality
6. Clean water and sanitation
7. Cheap and affordable energy
8. Decent work and economic growth
9. Industry, innovation and infrastructure
10. Reduced inequalities
11. Sustainable cities and communities
12. Responsible consumption and production
13. Climate action
14. Life below water
15. Life on land
16. Peace, justice and strong institutions
17. Partnerships for the goals

Figure 1. United Nations 17 goals for sustainable development (UN, 2016).

Despite this recent rhetoric on the 'indivisibility' of Goals for human development and protection of the 'non-human environment' (United Nations (UN) 2015, 6), this formulation sustains the anthropocentrism of the Brundtland Report, setting 'humans' apart from (perhaps even 'above') the 'environment'. This position remains influential. Whitehead (2014, 263) has suggested, following Bernstein (2000), that Brundtland established the foundation for 'liberal environmentalism', a position on environmental protection that downplays the contribution of economic growth and free markets to current environmental crises (Rees 2003). This perspective is given a further neoliberal twist in 'green capitalism', in which profit and entrepreneurialism are considered the means to save Earth from climate change by the development of technologies to reduce carbon emissions or geo-engineering to capture greenhouse gases already polluting the atmosphere (Prudham 2009, 1596).

To develop an alternative, post-anthropocentric perspective on sustainability and sustainable development, we would highlight three associated aspects from our earlier discussion of feminist materialist and posthumanist ontology. First, a posthuman approach requires that we shift from an essentialist model of entities with fixed attributes ('marble is hard but brittle; a human can think and talk') to a relational understanding. In such an ontology, matter (animate and inanimate) is to be studied not in terms of what it is or is not, but in terms of what it *does* relationally: what associations it makes as it affects and is affected, and what consequences and capacities derive from these affective interactions (DeLanda 2005; Deleuze 1988, 124–125). Rather than focusing upon humans as 'individuals' (literally: 'indivisible'), what we may term a 'posthuman' is an assemblage of biological, sociocultural and environmental elements, whose capacities to affect and be affected are contingent upon setting and emergent in its relations with other matter (Barad 2001, 96; DeLanda 2006, 10–11).

Second, the recognition that capacities are always context-dependent requires that we also acknowledge the unevenness of how 'human' capacities manifest. As Haraway (1991, 158) has revealed, sexism, colonialism and anthropocentrism have sustained the privilege of some (predominantly male, white, rich and Western) humans over others and over non-human animate and inanimate matter. In this analysis, a supremacist politics of sexualisation, racialisation and naturalisation of the West's Others (ibid: 150) has led to the despoliation of the environment, the current environmental crisis of climate change *and* the inequalities between global North and South. The category of 'human' and the concept of 'humanity' are revealed as humanist aggregations that obscure the diversity and inequalities between genders, races, incomes, abilities, nationalities and other stratifications (Braidotti 2019, 159). Within this diversity, some play a much greater part in using energy and resources and generating pollution than others (Agyeman and Evans 2004; Klinsky et al. 2017). This insight affirms that a posthuman ontology and ethics incorporates a concern with social justice to challenge these inequities, while policies to address climate change must also address 'climate justice' (Schlosberg and Collins 2014). Our terminological use of '(post)humans' in the remainder of this paper is an effort to mark out this critical recognition of diversity and inequalities, in place of the aggregating terms 'humans' and 'humanity'.

Third, that methodologically, analysis of issues of sustainability or sustainable development must resist assessing events in terms of humanistic values or by ascribing privilege to human agency (Bennett 2010, 120; Braidotti 2013, 56). Events assemble because of the affective capacities of both (post)human and non-human matter, but in turn, it is these assemblages that produce (post)human and non-human capacities (Cudworth and Hobden 2015, 140). Consequently, non-human materialities are 'bona fide participants' within events and interactions, rather than 'recalcitrant objects, social constructs, or instrumentalities' (Bennett, 2010, 62, see also Fox and Alldred, 2018; Conty 2018). Understanding the impact of an environmental event requires assessing all the capacities it produces – for both (post)human and non-human matter: which possibilities are opened up and which are constrained or closed down by this assemblage (Braidotti 2013, 60; see also Buchanan 1997 on an ethics of becoming).

With these three aspects of posthuman ontology in mind, 'sustainability' is no longer to be considered as a state to be achieved, but rather as a flow of multiple affects that produces capacities and potential in (post) human and non-human matter (Braidotti 2011, 312–3; Parr 2009, 161). This post-anthropocentric understanding of sustainability and sustainable development moves beyond a narrow focus on 'human' potential, to acknowledge the capacity of all matter non-human as well as (post)human to 'become other' (Guattari 2000, 20): in other words, to enhance its capacities. Sustainable development in this perspective means acknowledging the potentials and 'becomings' of all elements of the assemblage. These range from the interactions between earth, air and water in the nitrogen and water cycles of the physical environment, to the productive life-courses of the diverse multiplicity of plants and wild animals, to the opportunities for all humans to work, play and interact productively – and to acknowledge these capacities in ways that do not oppose (post)human capacities to those of other materialities.

At the same time, with (post)humans no longer ontologically separate from the environment, an ethics of becoming (Braidotti 2013, 100) applies as much to (post) humans' capacities as to the becoming of the non-human. 'Sustainable development' is replaced with '(post)human becoming', focusing not upon sustained human privilege over other parts of the environment, but upon addressing inequities between (post)humans

based on income, geography, race and gender. What counterposes such a recognition to an anthropocentric focus is that now possibilities for becoming are located within a broader concern with ecological potential and diversity: what sustains 'the environment' can also be 'emancipatory' of (post)humans (Cudworth and Hobden 2015, 144).

This posthuman perspective on sustainability as ecological potential subtly shifts how we should consider the 17 goals of the United Nations statement on sustainable development discussed earlier. As was noted, these have been articulated within a discourse that ties environmental sustainability 'indivisibly' to economic and human social development; indeed, that considers the latter as a necessary precondition for the achievement of the former. While not rejecting the valid aspirations of the UN and other bodies to emancipate (post)humans economically and socially, once the latter are regarded as integral to the environment, this distinction dissolves. The posthuman commitment must be instead to promote those actions that can enhance the environment's – and consequently also (post)human – potentialities, and moderate those that would limit that potential – be that by exhausting natural resources, filling the atmosphere with greenhouse gases, or limiting human possibilities through poverty, economic inequities or threats to health. We further develop this proposition, and its significance for environmental sustainability policy, in the following section.

Posthumanism, policy and the unusual capacities of (post)humans

If, as we have argued, global policy on sustainability and sustainable development is framed by anthropocentrism, the same can also be said for much other environmental decision-making, right down to the planning committees of local government that adjudicate on proposals for the natural and built environment. These assessments weigh concerns for the natural environment against national or local economic interests (Fox and Alldred, 2017, 39). However, it would be simplistic to consider this a balancing act between humanist and anti-humanist values. Often, protection of the environment conceals desires to ensure and protect (post) human opportunities to enjoy natural beauty or interact with wildlife, protect pollinators essential for agriculture, prevent threats to livelihoods or housing and so forth. Take, for example, recent campaigns and legal struggles for and against shale gas extraction. US and UK policymakers embraced extraction as a means to both lower prices and provide energy security. But while local campaigners' opposition has been partly about environmental despoliation. it was mostly to do with human safety and protection of property and water supplies from earthquakes caused by the drilling technology (Cotton, Rattle, and James 2014). All too often, such policymaking is about weighing one anthropocentric interest against another.

The posthuman perspective we have developed in this paper steps outside this humanist framing of policy. With (post)humans understood as an integral component of environment, (post)human and non-human matter are inextricably entangled in a simultaneously geological, geographical, cultural, social and affective assemblage. Minerals, wind, air, trees, wildlife, (post) humans, technologies, money, social formations and a myriad of other material constituents interact in a complex and unending affective flow. Environmental policymaking is no longer a balancing act between 'environmental' and 'human' concerns. Rather than privileging the latter over the former (humanism) or the former over the latter (anti-humanism), or indeed, privileging the capacities of some (rich, male, global North) over others, posthuman environmental policy aims to enhance the capacities of both non-human and (post)human.

Does that mean that in practice, posthuman policy should operate to the maxim: 'tread lightly on the earth', as environmentalists have sometimes argued (Bennett 2010, 121)? To further unpack what a posthuman policy on sustainability as ecological potential entails, we turn once again to feminist materialist scholarship, and particularly the work of Jane Bennett. The affectivity and emergent capacities of matter, Bennett (2010, 117) has argued, imbues the material world with a vitality that has been largely ignored in humanist and anthropocentric perspectives. (Post)humans are no longer prime movers; no longer in charge of the 'irrepressible flows of encounters, interactions, affectivity and desire' (Braidotti 2013, 100) that produce the world and everything in it. These flows (which *are* the 'becoming' of the planet) are the engine by which the global environment gets on – continually – with its assembling, dis-assembling, transforming and becoming. (Post)humans may be an integral part of that becoming, but they are not its lone architects (Bennett 2005).

Bennett's analysis offers a means to operationalise a posthuman 'sustainable becoming' policy. All matter has potential to 'become', be this a geological, meteorological, biological, economic, sociocultural, emotional or psychological becoming. An ethics of sustainability as ecological potential may be founded on the extent to which any action enables and enhances capacities (for instance, the capacity of the atmosphere to regulate the earth's climate or the capacity of living organisms to engage productively with their ecological niches). By contrast, acts that constrain becoming are environmentally unethical. Such constraints include actions that treat (post)human and non-matter as exploitable resources to which exchange value is ascribed (Moore 2017, 606); non-renewable use of animals, plants or materials; and policies and economic systems that sustain social and economic inequalities and injustices (Baer, 2018, 42).[7]

However, while this ethics may go some way to redress the ecological balance between (post)human and non-human, Bennett (2010, 121–122) goes on to make a further key point about the capacities of (post) humans as part of 'the environment'. In an environment in which (post)humans are merely one affectivity among many,

> … frugality is too simple a maxim. Sometimes, eco-health will require individuals and collectivities to back off or ramp down their activeness, and sometimes it will call for grander, more dramatic and violent expenditures of human energy (Bennett 2010, 122).

It appears clear to us that we live now in circumstances where the latter option applies. If there were once a time when humans could have stepped back to let the Earth and all the vital materialities it comprises 'get on with it', in the era of anthropogenic climate change and massive environmental degradation, this can no longer be the whole basis for posthuman sustainability policy.

Building on this assessment, our next proposition is radical, perhaps even seeming counter-intuitive within the post-anthropocentric framing of environment we have developed. We would suggest that (post)humans sometimes manifest relationally some unusual capacities that must not be ignored or sidelined. These include the capacity to attribute meaning to – or otherwise conceptualise – events; to act altruistically towards unknown others; to imagine the future and create technologies to deliver it; and to use reason to theorise, predict or anticipate future or unseen events (see also Murdoch 2001, 127; Schmidt 2013, 189–190).

We would further contend that these unusual capacities are now – perhaps ironically – essential to address anthropogenic environmental challenges. They should not be denied or rejected simply to assert an ecological purism that sees 'humanity' as the problem but need to be part of a vital materialist mix, along with the material capacities of non-human elements of the environment (Lorimer 2015, 4). The present climate change crisis will not only affect (post)human existence but that of many millions of living organisms, many of which face extinction – with unknown consequences for a biosphere that has evolved over billions of years (Thomas et al. 2004; Urban 2015). Anthropogenic de-stabilisations of ecologies can lead to catastrophic changes such as desertification or out-of-control greenhouse gas emissions (Scheffer et al. 2001), which in a worst-case scenario could render Earth uninhabitable by known life-forms. Evolutionary and geological time-scales are too slow to address either the effects or the causes of spiralling anthropogenic climate change, including the kinds of socio-political conflicts between economic and environmental interests over continued fossil fuel extraction described earlier.

In these circumstances, the physical capacities of non-human matter must be augmented with these unusual (post)human capacities. For example, the latter can be applied to predict, model and enact possible environmental, political and economic futures; to develop technologies such as carbon capture that can reduce the concentrations of atmospheric greenhouse gases; and to act altruistically to protect the non-human elements of the environment.[8]

However, this is not to re-privilege (post)human reason and ingenuity by the back door (for instance, by assuming that the market and technology can together solve climate change, as argued by 'green capitalists' (Prudham 2009, 1596; Zysman and Huberty 2014), nor is it a return to an earlier humanist 'exemptionalist' thesis (Dunlap and Catton 1994) that once again separates (post)humans from the rest of the environment. A posthuman environmental ethos is no longer concerned merely to assure that the Earth's resources remain in place for a few more (post)human generations, or to replace (post)human with non-human privilege. Instead, its objective is to encourage processes of becoming that together produce an environment that is endlessly emerging, changing, fragmenting and fracturing, opening up both (post)human and non-human possibilities rather than closing them down. By developing and activating the full range of (post)human and non-human capacities at our disposal, we can establish an environment-assemblage that is vital, self-organising and emergent. That must be the driver of environmental policy as we confront the current crises (see Fox and Alldred, 2020, for more on a posthuman policy response to climate change).

Discussion

We have set out here a case for a post-anthropocentric ontology of environment, founded upon feminist materialist scholarship, that draws human and non-human relations into a single realm rather than setting them in opposition. This posthuman ontology cuts across humanism and anti-humanism, acknowledging the positive aspects of both, while highlighting critically disadvantages of each as the exclusive basis for a science and an ethics of environment. It incorporates humanism's celebration of individual and collective (post)human potential. From anti-humanism it recognises the limitations of humanism – both in terms of its privileging of humans over other animate and inanimate matter, and the aggregating and difference-denying conception of 'humanity' created in the image of a white, male, rich human from the global North.

This synthesis has the capacity to cut across dualisms of human/non-human and culture/nature, to open up new perspectives on sustainability, sustainable development policy and action to address the burgeoning crisis of climate change. Its foundations in materialist theory established two divergences from previous work. First, it theorises (post)humanity as an integral material

constituent of 'the environment', neither privileged nor de-privileged in relation to non-human matter. Second, it emphasises the relational character of materiality. Rather than entities with defined attributes, matter gains its capacities to affect and be affected when assembled with other materialities. Consequently, what a body or another other matter can do is entirely contingent and contextual: an important feature for a theory of environment.

An emphasis on the contextuality of capacities in posthuman ontology offers a further opportunity for environmental sociology: it makes a concern for social justice and 'climate justice' (Schlosberg and Collins 2014) an inextricable element within discussions of environmental policy and activism. 'Humans' have conventionally been defined in terms of specific attributes held in common, and divergences between these attributes and those of other animate and inanimate matter. However, from a posthuman perspective, capacities are not universal attributes of 'human' bodies/minds, but are emergent, relational and contingent upon contexts including geography, income, race, gender and other social stratifications. Environmental impacts on (post)humans (such as diseases, pollution, flooding and so on) intersect with these stratifications, such that environmental changes due to climate or pollution do not affect all (post)humans equally. Posthuman policies must acknowledge the uneven impact of climate change on global North and South, and incorporate a commitment to social justice as a core element, thereby supplying a critical edge to a posthuman ontology of environment (Cudworth and Hobden 2015, 144–145).

In the second part of the paper, we explored how this posthuman ontology can inform a post-anthropocentric perspective on sustainability and sustainable development. We critiqued the UN policy statements on sustainable development for their implicit anthropocentrism, which treats the Earth as a resource to be enjoyed by future generations of humans. In particular, we criticised the twin track approach to sustainability that links environmental protection firmly to the social and economic development of humans, while downplaying (potentially disastrously) development and economic growth as core drivers of environmental degradation and global climate change (Baer, 2018; Rees 2003). This link between environmental protection and economic development sustains an anthropocentric bias in policy, and opens the way to 'green capitalist' policies based on a market economy, while closing the door on no-growth approaches that recognise the environmental harm that capitalism's endless search for growth and profit brings.

The post-anthropocentric alternative that we have proposed regards sustainability not from the narrow perspective of human well-being but as a far broader concern with ecological potential. This shift requires that matter (non-human and human) should be valorised for its relational liveliness and potential for becoming, rather than for how its capacities contribute to human health, economic prosperity, pleasure or even survival. Furthermore, a relational focus means acknowledging the unusual or even *unknown* capacities of different (post)human and non-human matters – because of the complexity of possible relations between materialities, we simply have no idea of the extent of what matter can do (Bennett 2010, xv). Consequently, a post-anthropocentric environmental ethics of 'fostering ecological potential' goes beyond valuing merely those capacities of a bird or a rock or the weather that impinge upon (post)human bodies. It will entail removing barriers or constraints on the emergent capacities of both non-human and (post)human matter to forge productive interactions and engagements: physically, chemically, biochemically, physiologically, psychologically or socially.

Such an agenda has profound implications for environmental policy, and we will conclude with a few brief reflections on sustainability policy. Elsewhere (Fox and Alldred, 2016,) we have argued that a posthuman policy to address climate change must address the multiple and complex flows that link (post)human and non-human matter. Evidence from both natural and social science research can reveal the constellations of relations and affects that produce global and local environmental events, including climate change and environmental degradations. Fortunately, much of this research has already been done and has been collated in the UN work on sustainable development (Intergovernmental Panel on Climate Change (IPCC) 2013, Intergovernmental Panel on Climate Change (IPCC) 2014). While we have been strongly critical of the UN position that links (post) human economic development to environmental protection for its anthropocentrism and underlying humanism, its recent emphasis on the 'indivisibility' of human and non-human suggests some potential convergence with the posthuman ontology outlined here. Further, the UN's concern with alleviating both poverty and climate change chimes with the social justice agenda that we have developed as part of a posthuman approach.

What is disturbing, however, is the poor progress towards those of the UN's 2030 Goals (United Nations (UN) 2015) that seek to address environment degradation and climate change – as acknowledged in its 2019 review (United Nations (UN) 2019, 1). This failure, we would argue, derives directly from the anthropocentrism of a position that ties environmental protection so closely to human economic development and growth. These latter endeavours contribute in so many ways to constraining rather than enabling non-human capacities, for example by increased consumption of energy and natural resources, waste production and consumer demand (Baer 2008).

Our analysis consequently suggests the need for an urgent shift in the UN perspective on

sustainable development, replacing an anthropocentric with a post-anthropocentric and posthuman ontology of environment, and offering a more critical assessment of economic development. However, this posthuman ethics also requires that we engage fully with those unusual (post)human capacities we outlined earlier: capacities that underpin both environmental policy-making and activism. In the present climate change crisis, (post)human responsibilities go far beyond liberal environmentalist actions such as reducing one's carbon footprint, eating less meat or avoiding single-use plastics. A shift toward no-growth economics must be combined with local actions (where the affects and interactions of daily life can foster ecological potential), national initiatives to innovate carbon-neutral and carbon-capture technologies, and trans-national programmes to re-distribute wealth from rich to poor, from global North to global South (Authors, forthcoming). Indeed, the 'expenditures of human energy' that Bennett (2010, 122) calls for are needed urgently and must be very grand and very dramatic indeed.

Notes

1 As considered at length later in the paper, sustainability is a contested concept that while addressing the continuity and diversity of the natural environment often is located within an implicit concern with human well-being and progress. The most often referenced definition (the Brundtland Report) sees sustainability as jointly dependent upon economic, social and ecological aspects, and described sustainable development as 'development that meets the needs of the present without compromising the ability of future [human] generations to meet their own needs' (Brundtland, Khalid, Agnelli et al. 1987, see also Lockie 2012).

2 In this paper, we apply a Deleuzian understanding of 'affect' as 'a capacity to affect or be affected' (Deleuze 1988, 101). Affect consequently replaces the conception of 'agency', often treated in social science as an exclusive capacity of humans. Assemblages emerge due to the affects between their constituents.

3 Stevens (2012, 579) has argued for an 'ecosociology' that extends ideas of 'the social' beyond the human. Latour (2005) went further, arguing for a sociology that recognises social, biological and physical forces as together producing the world around us (see also Rice 2013, 257), while Lidskog and Waterton (2016, 399) suggest that in the 'Anthropocene' both physical processes and human culture produce the 'conditions of possibility for life on earth'.

4 Anti-humanism refers to perspectives that displace concern with humans, human subject and human experience from centre stage (Durkin 2014, 129), emphasising instead the primacy of other entities such as non-human organisms, technology, the natural environment or social forces. Within sociology, it manifests in a range of approaches, including Marxist and other structuralist focuses on social structures and power, systems theories and post-structuralism (Turner 1977; Paden 1987).

5 New materialism describes a wide range of philosophical, feminist and social theory perspectives that recognise the agentic capacities of all matter, and is not limited to the Deleuzian ontology that underpins Braidotti's feminist materialism (Authors, 2017, 13–22; Cudworth and Hobden 2015, 136–137). All may be characterised however as posthumanist and post-anthropocentric; materially embedded and embodied; relational and contingent rather than essentialist or absolute; and as supplying social theory with the means to re-immerse itself in a material world that is plural, complex, heterogeneous and emergent. New materialist ontology is monistic, rejecting dualisms of nature/culture, human/non-human, structure/agency, reason/emotion, animate/inanimate and mind/matter. The increased recent interest in materialist perspectives among feminists and others has been seen as a reaction against social constructionism and textual approaches in social theory (Coole and Frost 2010, 2) though critics have also linked it to neoliberalisation (Braun 2015; Pellizzoni 2016). The other principal criticisms of the new materialisms are that they de-politicise social justice struggles by sidelining essentialist models of identity; that the absence of any conception of social structures, mechanisms or systems undermines capacity to analyse power, resistance and inequalities; and that their 'newness' is only in relation to Western and Eurocentric ontology. For overviews of the new materialisms and discussions of these issues, see (Fox and Alldred, 2018; Coole and Frost 2010; Cudworth and Hobden 2015; Devellennes and Dillet 2018; Rosiek, Snyder, and Pratt 2019).

6 The claimed positive relationship between economic development and environmental protection has been queried by other scholars, who argue that indeed it is economic development and the capitalist model of production and accumulation that has led to the current environmental crises (Baer 2008; Moore 2017; Rees 2003; Wallis 2010).

7 Earlier we noted that the capacities of matter emerge when assembling with other materialities in events. Given that there are an infinite number of possible events, with an infinite number of possible arrangements of matter, this means that we can have no idea what potential capacities (or incapacities) a body or a thing has in advance. Many environmental protection campaigns have been devoted to efforts to address what have been considered the inherent capacities and incapacities of particular species or inanimate non-human entities, as revealed by scientific inquiry. For example, initiatives to reinstate hedges and meadow areas around fields aim to sustain insects' and birds' capacities to feed from the pollen and seeds being lost to monoculture agriculture; limiting ocean warming protects the capacities of Earth's ice-caps to sequester carbon dioxide and other greenhouse gases. A shift to a relational understanding of 'capacity' suggests that efforts to protect such capacities should be augmented with a broader concern to enhance matter's – including (post)humans' – potential to form as yet unknown productive assemblages with other matter.

8 Altruistic actions range from individual behaviours such as using electricity from renewable rather

than cheaper sources, cutting down meat consumption or limiting family size, through to national initiatives to cease using fossil fuel resources, recycle and reuse rather than manufacture goods afresh, and support poorer nations to adopt clean technologies: all of which have economic costs attached.

Disclosure statement

No potential conflict of interest was reported by the authors.

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References

Agyeman, J., and B. Evans. 2004. "'Just Sustainability': The Emerging Discourse of Environmental Justice in Britain?." *Geographical Journal* 170 (2): 155–164. doi:10.1111/j.0016-7398.2004.00117.x.

Baer, H. 2008. "Global Warming as a By-product of the Capitalist Treadmill of Production and Consumption - The Need for an Alternative Global System." *The Australian Journal of Anthropology* 19 (1): 58–62. doi:10.1111/taja.2008.19.issue-1.

Baer, H. 2018. *Democratic Eco-socialism as a Real Utopia. Transitioning to an Alternative World System*. New York: Berghahn Books.

Barad, K. 1996. "Meeting the Universe Halfway: Realism and Social Constructivism without Contradiction." In *Feminism, Science and the Philosophy of Science*, edited by L.H. Nelson and J. Nelson, 161–194. Dordrecht: Kluwer.

Barad, K. 2001. "(Re)configuring Space, Time and Matter." In *Feminist Locations*, edited by M. Dekoven, 75–109. New Brunswick, NJ: Rutgers University Press.

Bennett, J. 2005. "The Agency of Assemblages and the North American Blackout." *Public Culture* 17 (3): 445–465. doi:10.1215/08992363-17-3-445.

Bennett, J. 2010. *Vibrant Matter*. Durham NC: Duke University Press.

Bernstein, S. 2000. "Ideas, Social Structure and the Compromise of Liberal Environmentalism. *European Journal of International Relations* 6 (4): 464–512.

Braidotti, R. 1994. *Nomadic Subjects: Embodiment and Sexual Difference in Contemporary Feminist Theory*. New York NY: Columbia University Press.

Braidotti, R. 2006a. "Posthuman, All Too Human: Towards a New Process Ontology." *Theory Culture & Society* 23 (7–8): 197–208. doi:10.1177/0263276406069232.

Braidotti, R. 2006b. *Transpositions*. Cambridge: Polity.

Braidotti, R. 2011. *Nomadic Theory*. New York: Columbia University Press.

Braidotti, R. 2013. *The Posthuman*. Cambridge: Polity.

Braidotti, R. 2019. *Posthuman Knowledge*. Cambridge: Polity.

Braun, B. 2015. "The 2013 Antipode RGS-IBG Lecture New Materialisms and Neoliberal Natures." *Antipode* 47 (1): 1–14. doi:10.1111/anti.v47.1.

Braun, B.W. 1997. "Buried Epistemologies: The Politics of Nature in (Post) Colonial British Columbia." *Annals of the Association of American Geographers* 87 (1): 3–31. doi:10.1111/0004-5608.00039.

Brundtland, G., M. Khalid, S. Agnelli, et al. 1987. *Our Common Future (The Brundtland Report)*. London: Oxford University Press.

Buchanan, I. 1997. "The Problem of the Body in Deleuze and Guattari, Or, What Can a Body Do?" *Body & Society* 3 (3): 73–91. doi:10.1177/1357034X97003003004.

Buchanan, I. 2017. "Assemblage Theory, Or, the Future of an Illusion." *Deleuze Studies* 11 (3): 457–474. doi:10.3366/dls.2017.0276.

Conty, A.F. 2018. "The Politics of Nature: New Materialist Responses to the Anthropocene." *Theory, Culture & Society* 35 (7–8): 73–96. doi:10.1177/0263276418802891.

Coole, D., and S. Frost. 2010. "Introducing the New Materialisms." Chap. 1. In *New Materialisms. Ontology, Agency, and Politics*, edited by D. Coole and S. Frost, 1–43. London: Duke University Press.

Cotton, M., I. Rattle, and V.A. James. 2014. "Shale Gas Policy in the United Kingdom: An Argumentative Discourse Analysis." *Energy Policy* 73 (October): 427–438. doi:10.1016/j.enpol.2014.05.031.

Cudworth, E., and S. Hobden. 2015. "Liberation for Straw Dogs? Old Materialism, New Materialism, and the Challenge of an Emancipatory Posthumanism." *Globalizations* 12 (1): 134–148. doi:10.1080/14747731.2014.971634.

DeLanda, M. 2005. *Intensive Science and Virtual Philosophy*. London: Bloomsbury.

DeLanda, M. 2006. *A New Philosophy of Society*. London: Continuum.

Deleuze, G. 1988. *Spinoza: Practical Philosophy*. San Francisco: City Lights.

Dempsey, N., G. Bramley, S. Power, and C. Brown. 2011. "The Social Dimension of Sustainable Development: Defining Urban Social Sustainability." *Sustainable Development* 19 (5): 289–300. doi:10.1002/sd.v19.5.

Devellennes, C., and B. Dillet. 2018. "Questioning New Materialisms: An Introduction." *Theory, Culture & Society* 35(7–8): 5–20. doi:10.1177/0263276418803432.

Dunlap, R.E., and W.R. Catton. 1994. "Struggling with Human Exemptionalism: The Rise, Decline and Revitalization of Environmental Sociology." *The American Sociologist* 25 (1): 5–30. doi:10.1007/BF02691936.

Durkin, K. 2014. *The Radical Humanism of Erich Fromm. Critical Political Theory and Radical Practice*. New York: Palgrave.
Fleurbaey, M., S. Kartha, S. Bolwig, Y. L. Chee, Y. Chen, E. Corbera, F. Lecocq et al. 2014. "Sustainable development and equity", In *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, edited by O. Edenhofer et al., 283–350. Cambridge: Cambridge University Press.
Fox, N. J., and P. Alldred. 2016. "Sociology, environment and health: A materialist approach." *Public Health* 141: 287–293.
Fox, N. J. and P. Alldred. 2017. *Sociology and the New Materialism*. London: Sage
Fox, N. J. 2018. "Social Structures, Power and Resistance in Monist Sociology: (New) Materialist Insights." *Journal of Sociology* 54 (3): 315–330.
Fox, N. J. and P. Alldred. 2020. "Re-assembling Climate Change Policy: Materialism, Posthumanism and The Policy Assemblage." *British Journal of Sociology*. doi:10.1111/1468-4446.12734
Franklin, A. 2006. "Burning Cities: A Posthumanist Account of Australians and Eucalypts." *Environment and Planning D: Society and Space* 24 (4): 555–576. doi:10.1068/d0105.
Griggs, D., M. Stafford-Smith, O. Gaffney, J. Rockström, M. C. Öhman, P. Shyamsundar, W. Steffen et al. 2013. "Sustainable Development Goals for People and Planet." *Nature* 495 (7441): 305–307. doi:10.1038/495305a.
Guattari, F. 2000. *The Three Ecologies*. London: Athlone.
Haraway, D. 1991. *Cyborgs, Simians and Women*. London: Free Association Books.
Haraway, D. 1992. "Otherworldly Conversations; Terran Topics; Local Terms." *Science as Culture* 3 (1): 64–98. doi:10.1080/09505439209526336.
Haraway, D. 1997. *Modest_Witness@Second_Millennium. Femaleman_Meets_Oncomouse*. New York: Routledge.
Intergovernmental Panel on Climate Change (IPCC). 2013. *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press.
Intergovernmental Panel on Climate Change (IPCC). 2014. *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press
Klinsky, S., T. Roberts, S. Huq, C. Okereke, P. Newell, P. Dauvergne, K. O'Brien et al. 2017. "Why equity is fundamental in climate change policy research". *Global Environmental Change* 44: 170–173.
Landecker, H., and A. Panofsky. 2013. "From Social Structure to Gene Regulation, and Back: A Critical Introduction to Environmental Epigenetics for Sociology." *Annual Review of Sociology* 39: 333–357.
Latour, B. 1993. *We Have Never Been Modern*. Cambridge, MA: Harvard University Press.
Latour, B. 2005. *Reassembling the Social. An Introduction to Actor Network Theory*. Oxford: Oxford University Press.
Lemke, T. 2015. "New Materialisms: Foucault and the 'government of Things' ." *Theory, Culture & Society* 32 (4): 3–25. doi:10.1177/0263276413519340.
Lidskog, R., and C. Waterton. 2016. "Anthropocene – A Cautious Welcome from Environmental Sociology?" *Environmental Sociology* 2 (4): 395–406. doi:10.1080/23251042.2016.1210841.
Lockie, S. 2012. "Sustainability and a Sociology of Monsters." *Sociologica* 2 (2): 1–14.
Lockie, S. 2016. "Sustainability and the Future of Environmental Sociology." *Environmental Sociology* 2 (1): 1–4. doi:10.1080/23251042.2016.1142692.
Lorimer, J. 2015. *Wildlife in the Anthropocene. Conservation after Nature*. Minneapolis MN: University of Minnesota Press.
Meloni, M. 2014. "How Biology Became Social, and What It Means for Social Theory." *Sociological Review* 62 (3): 593–614. doi:10.1111/1467-954X.12151.
Meloni, M. 2016. "From Boundarywork to Boundary Object: How Biology Left and Re-entered the Social Sciences." *Sociological Review Monograph* 64 (1): 61–78. doi:10.1002/2059-7932.12013.
Moore, J.W. 2017. "The Capitalocene, Part I: On the Nature and Origins of Our Ecological Crisis." *The Journal of Peasant Studies* 44 (3): 594–630. doi:10.1080/03066150.2016.1235036.
Murdoch, J. 2001. "Ecologising Sociology: Actor-Network Theory, Co-construction and the Problem of Human Exemptionalism." *Sociology* 35 (1): 111–133. doi:10.1177/0038038501035001008.
Paden, R. 1987. "Foucault's Anti-humanism." *Human Studies* 10 (1): 123–141. doi:10.1007/BF00142989.
Parr, A. 2009. *Hijacking Sustainability*. Cambridge MA: MIT Press.
Pearce, D., A. Markandya, and E.B. Barbier. 1989. *Blueprint for a Green Economy*. London: Earthscan.
Pellizzoni, L. 2016. "Catching up with Things? Environmental Sociology and the Material Turn in Social Theory." *Environmental Sociology* 2 (4): 312–321. doi:10.1080/23251042.2016.1190490.
Pickering, A. 2005. "Asian Eels and Global Warming: A Posthumanist Perspective on Society and the Environment." *Ethics and the Environment* 10 (2): 29–43. doi:10.2979/ete.2005.10.issue-2.
Prudham, S. 2009. "Pimping Climate Change: Richard Branson, Global Warming, and the Performance of Green Capitalism." *Environment and Planning A* 41 (7): 1594–1613. doi:10.1068/a4071.
Ratner, B.D. 2004. "'Sustainability' as a Dialogue of Values: Challenges to the Sociology of Development." *Sociological Inquiry* 74 (1): 50–69. doi:10.1111/j.1475-682X.2004.00079.x.
Rees, W.E. 2003. "Economic Development and Environmental Protection: An Ecological Economics Perspective." *Environmental Monitoring and Assessment* 86 (1): 29–45. doi:10.1023/A:1024098417023.
Rice, J. 2013. "Further beyond the Durkheimian Problematic: Environmental Sociology and the Co-construction of the Social and the Natural." *Sociological Forum* 28 (2): 236–259. doi:10.1111/socf.12017.
Rosiek, J.L., J. Snyder, and S.L. Pratt. 2019. "The New Materialisms and Indigenous Theories of Non-human Agency: Making the Case for Respectful Anti-colonial Engagement." *Qualitative Inquiry*. doi:10.1177/1077800419830135;.
Scheffer, M., S. Carpenter, J.A. Foley, C. Folke, and B. Walker. 2001. "Catastrophic Shifts in Ecosystems." *Nature* 413 (6856): 591–596. doi:10.1038/35098000.
Schlosberg, D., and L.B. Collins. 2014. "From Environmental to Climate Justice: Climate Change and the Discourse of Environmental Justice." *Wiley Interdisciplinary Reviews: Climate Change* 5 (3): 359–374.
Schmidt, J. 2013. "The Empirical Falsity of the Human Subject: New Materialism, Climate Change and the Shared Critique of Artifice." *Resilience* 1 (3): 174–192. doi:10.1080/21693293.2013.837241.
Stevens, P. 2012. "Towards an Ecosociology." *Sociology* 46 (4): 579–595. doi:10.1177/0038038511422586.

Sundberg, J. 2014. "Decolonizing Posthumanist Geographies." *Cultural Geographies* 21 (1): 33–47. doi:10.1177/1474474013486067.

Thomas, C.D., A. Cameron, R.E. Green, M. Bakkenes, L. J. Beaumont, Y.C. Collingham, B.F.N. Erasmus et al. 2004. "Extinction Risk from Climate Change." *Nature* 427 (6970): 145. DOI:10.1038/nature02121.

Todd, Z. 2016. "An Indigenous Feminist's Take on the Ontological Turn: 'ontology' Is Just Another Word for Colonialism." *Journal of Historical Sociology* 29 (1): 4–22. doi:10.1111/johs.12124.

Turner, B.S. 1977. "The Structuralist Critique of Weber's Sociology." *British Journal of Sociology* 28 (1): 1–16. doi:10.2307/589705.

United Nations (UN) 2015. "*Transforming Our World: The 2030 Agenda for Sustainable Development*". UN General Assembly Resolution 70/1. Geneva: United nations. https://sustainabledevelopment.un.org/post2015/transformingourworld/publication

United Nations (UN). 2016. *Sustainable Development Goals*. Geneva: United Nations. http://www.un.org/sustainabledevelopment/.

United Nations (UN). 2019. *The Sustainable Development Goals Report*. Geneva: United Nations. https://unstats.un.org/sdgs/report/2019/#sdg-goals.

Urban, M.C. 2015. "Accelerating Extinction Risk from Climate Change." *Science* 348 (6234): 571–573. doi:10.1126/science.aaa4984.

van der Tuin, I., and R. Dolphijn. 2010. "The Transversality of New Materialism." *Women: A Cultural Review* 21 (2): 153–171.

Walker, G. 2005. "Sociological Theory and the Natural Environment." *History of the Human Sciences* 18 (1): 77–106. doi:10.1177/0952695105051127.

Wallis, V. 2010. "Beyond 'Green Capitalism' ." *Monthly Review* 61 (9): 32. doi:10.14452/MR-061-09-2010-02.

Whitehead, M. 2014. "Sustainability." In *Critical Environmental Politics*, edited by C. Death, 257–266. London: Routledge.

World Health Organisation (WHO). 2005. "*Ecosystems and Human Well-Being*." (A Report of the Millennium Ecosystem Assessment). Geneva: WHO.

Zysman, J., and M. Huberty. 2014. *Can Green Sustain Growth? from the Religion to the Reality of Sustainable Prosperity*. Stanford CA: Stanford University Press.