Perhaps the Dodo should have accounted for human beings? Accounts of humanity and (its) extinction

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Abstract

Purpose – The purpose of this paper is to offer a counter-narrative to accounts of specific species extinction. The authors place humanity's ways of organising at the core and recognise that only fundamental re-appraisal of humanity's taken-for-granted narratives offers hope for biodiversity and sustainability. The authors challenge producers of accounts of all sorts to reconsider the context and level of resolution of their accounts. The authors argue that humankind is the root cause of most (if not all) current species extinctions; that such extinctions represent one reason why humanity might itself be threatened with extinction; and why human extinction might be a good thing. The authors need to imagine other, better, futures.

Design/methodology/approach – The piece is an essay which assembles a wide range of literature in order to support its contentions.

Findings – There are many individual accounts of species which explore the (albeit very serious) symptoms of a problem without, the authors maintain, examining the systematic source of the problem. The source problem is western mankind's organisation and somewhat taciturn conception of humanity. There is a lack of accounts offering new possibilities.

Research limitations/implications – The piece is an essay and, consequently, limited to the quality of the argument presented. The essay suggests that the principal implications relate to how producers of counter-accounts frame their construction of accounts and how accounts of species extinction need to be more cognisant of underlying causes.

Practical implications – Without substantial change, planetary ecology, including humanity, is very seriously threatened. Imagining a plausible future is a most practical act of faith.

Social implications – The essay suggests that as accountants the authors might think to approach the counter-accounts with a lower level of resolution: one that is directed towards a more challenging notion of what it is to be human.

Originality/value – Whilst building upon the growing sophistication in the understanding of (new) accounts and responding to the emerging literatures on biodiversity, species extinction and utopian vision the authors offer what the authors believe to be a unique suggestion in the accounting literature about the extinction of mankind.

Keywords Narratives, Humanity, Biodiversity, Extinction, Accounts, Utopian method

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> A human being is a part of the whole, called by us "Universe," a part limited in time and space. He experiences himself, his thoughts and feelings as something separated from the rest – a kind of optical delusion of his consciousness[1]. (Albert Einstein, 1950)

Yet for all this, our world is still shaped by stories. Through television, film, novels and video games, we may be more thoroughly bombarded with narrative material than any people that ever lived. What is peculiar, however, is the carelessness with which these stories are channelled at us – as entertainment, a distraction from daily life, something to hold our attention to the other side of the ad break. There is little sense that these things make up the equipment by which we

navigate reality. On the other hand, there are the serious stories told by economists, politicians, geneticists and corporate leaders. These are not presented as stories at all, but as direct accounts of how the world is. Choose between competing versions, then fight with those who chose differently. UNCIVILISATION: THE DARK MOUNTAIN MANIFESTO, available at: http://dark-mountain.net/about/manifesto/

1. Introduction[2]

We already have accounts of species and their well-being, or more usually, their endangerment. Whilst more detailed accounts of the specific conditions of endangerment of specific species (bees is an unusually good example, Atkins and Atkins, 2016) are clearly valuable from the point of view of that species and its management – or (perhaps more accurately) humanity's management of itself with respect to that species – there is a danger that as Rickards (2015) argues, we are privileging our narratives of humans as steward over other, more complex narratives of humans as systems dynamic and/or over humans as geological force (see also, Latour, 1998).[3] Although management and activity in the face of species extinction appeals to our humanity at some level, such a response must, we argue, be cognisant of its essential modernity and reductionism. We wish to argue that the causes of species extinction are systemic and human; and that such extinctions are only one – albeit critical – manifestation of un-sustainability.

Whilst nothing we would want to say should be taken as arguing against the development of good (as opposed to partial and self-serving) reliable accounts of organisational engagement with habitat and species, we want to argue for the simultaneous maintenance of meta-narratives – meta accounts if you will – through which such organisational – and species-level accounts should be viewed, understood and critiqued. In this sense, we are drawing simultaneously from Brown and Dillard's (2013) project arguing for multiple and conditional accounts and Boland and Schultze's (1996) call for accounting to be located within a sense-making narrative that recognises both narrative and calculative accounts as parts of the complex narratives within relationships.

Furthermore, as Lohman (2015) argues, accounts of nature imply that we (those seeking and/or constructing the accounts) are clearly distinguished from nature (the "object" for which we wish to account). Such immanent thinking is an inevitable consequence of modernity with all that this entails (Leiss, 1972/1994; Latour, 1998; Dresner, 2002) but it need not, we believe, be immutable, (see especially, Vinnari and Dillard, p. 26). That is accounts of "nature", if approached appropriately, might be just as likely to engage us and generate senses of closeness (Gray *et al.*, 2014) as they are to create difference, distance, and separation (Jones and Solomon, 2013; and see also Stone, 1974)[4]. Essentially, any accounts/narratives that we discuss here must be as much about ourselves and our sense of ourselves as they are accounts of the species. It may not be possible to escape from our cage of immanence but perhaps through better conception(s) of nature we might better reflect conceptions of ourselves.

It is in this sense that we gain much needed support from Levitas (1990, 2013) and her discussion of utopia, (see also Atkins *et al.*, 2015). The concept of utopia, she argues, allows us to step slightly away from the present in order to assess what we now do but in the light of what we could or should do (2013; p. xvii; see also Roberto Unger)[5]. Humanity finds itself alienated from, what Marx called, "species being" and this distorts our humanity[6]. But we retain, it is claimed, a longing for a fulfilled settlement of this alienation that brings us back to (what Levitas and others call) a "state of grace", (2013, p. 12). These utopian yearnings need not embrace visions of perfection – such as Garden of Eden fantasies for example – because in secular reasoning such states would probably be impossible. However, utopia allows us to embrace accounts of the potential, the possible and the imagination that, crucially, overcome the realistic fear that "All forms of radical alterity are rendered illegitimate unless they can be contained within or coopted to the existing system"

(2013, p. 10; see also Atkins *et al.*, 2015). For Levitas, as for many writers (see especially Caldwell, 1999; but see also Lohman, 2015; Ceballos *et al.*, 2015; Kolbert, 2014; Monbiot, 2014) it is that separation of humanity from nature and humanity from humanity plus the ensuing difference in relationships that sits at the heart of this alienation and of this yearning (see also Tregidga, 2013). At this point in Earth's history, it remains an open question whether we want the future of Earth to turn entirely on humans – we may have entered the Anthropocene, but as Rolston III (2010) argues, we ought to have a choice whether or not we enter an Anthropocentric era.

The principal purpose of this short essay is to offer a cautionary tale with which to counter the weight of immanent accounts of humanity's interaction with specific species[7]. The essence of this intention is to argue that a focus upon the fate of specific species can so easily miss the point: namely that humanity's ways of organising are the root cause of such fates. Our specific, somewhat limited, goal would be to encourage (social) accountants concerned with accounts of species endangerment to look wider – to lower the level of resolution – and to see the fate of bees, tigers, dolphins or wildcats as a function of a fundamental human failure. Accounts which avoid such examination of the root causes are arguably very partial and misleading accounts.

But we also take this opportunity to draw our canvas rather wider. That is we suggest that any consideration of a specific species' endangerment must also seek to simultaneously recognise that any species extinction may hasten humanity's own extinction as a species – as well as arguably diminishing the "humanity" of humankind as a species. Thus our arguments seek to interweave themes of humanity, extinction, nature and loss in order to encourage reconsideration of the context of accounts of species. Inevitably that set of concerns plays out as a challenge to all (social and environmental) accountants to step outside their current immanence: to suggest that we cease to fold the "accounts" we currently produce into some realm of the acceptable when the essence of the problem may well be the implicit and self-disciplining constraints within which the account is couched. All accounts might then become explicitly self-aware accounts of humanity and what it means to be human: as opposed to most current accounts which, we would argue, implicitly demonstrate unconscious (false) assumptions about our own species. We wish to commend the adoption of different meta accounts that might help us see more clearly that our activities as (social) accountants are principally the production of accounts by humanity for humanity and to suggest we need more (although not necessarily new) meta-narratives of humanity. Such meta-narratives would not necessarily have mankind as the heroic central figure, would not flatter humanity and would not necessarily distinguish us from "nature". Indeed we need more substantive narratives which do not have happy endings and which, in all probability, result in the demise of humanity – at least as we conceive of that notion in western modernity (Rees, 2003; Bryner, 1999; Boland and Schultze, 1996). At the very least, such narratives would seek to provide an appropriate humility and abrupt correction to our place in the cosmos. As Foreman (2010, p. 100) reminds us:

> The time of Man is but an eyeblink in the great span of Earth's being, yet humans of all kinds find it hard to think of an Earth-time when we were not here or of an Earth-time to come when we will not be here. So we think Earth is ours[8].

In this short piece, we do not try to fully examine and/or escape our inherent – if qualified – anthropomorphism. We do not argue that, for example, economic humanity needs the economic value that environment provides. We find this, offensive, self-serving and actually rather ridiculous. Rather we prefer to argue that humanity distinct from/devoid of "nature" really makes no sense at all: not just that we would find such a condition aesthetically, ethically and spiritually devastating but it would suggest to us an account[9] of humanity that we would not recognise as human. (For accounts expressing similar

sentiments, see for example, Rolston III, 2010; Tinker, 2010; Watt-Cloutier, 2010). Whilst humanity needs "nature" to continue; it seems exceptionally unlikely that any of "nature" needs humanity for anything at all. As the essay develops we find an irony emerging: that the simplest way in which we might aid planetary sustainability would be hasten humanity's extinction; whilst modernity, too, seems intent upon achieving this very aim through a destruction of ecology in the name of self-congratulatory accounts of human progress.

This short essay is structured as follows. Section 2 briefly rehearses our global (and largely western and modernist) accounts of nature, (non-human) species and their extinctions. Section 3 argues that the root cause of such extinctions is humanity and its current ways of organising. Section 4 explores some of the prospects of human extinction and ponders the question of how such extinction might be understood and narrated. Section 5 revisits utopias and dystopias in order to engage imaginative possibilities for future and different narratives. Section 6 offers a few conclusions.

2. Accounts of non-human extinctions and their cause(s)

Humanity in the twentieth and twenty-first centuries has been well provided with accounts of species extinctions[10] from Carson's (1962) *Silent Spring* through such seminal works as *Blueprint for Survival* (Goldsmith *et al.*, 1972) to the now widely accessible narratives provided by the United Nations (see e.g. United Nations Millennium Ecosystem Assessment, 2005; UNEP, 2012) and WWF. WWF in particular have tracked and reported the detail of, what Kolbert (2014) amongst others have called, the "6th extinction crisis"[11]. The WWF (2014) Living Planet Index (LPI), for example, reports that the number of mammals, birds, reptiles, amphibians and fish across the globe has, broadly, declined by 50 per cent in the last 40 years. And the WWF (2016) "Living Planet Report" predicts a 67 per cent demise in vertebrate populations by 2020. This is placed in a context which argues that species loss today is between 1000 and 10,000 times higher than the natural "background" extinction rate[12] (Barnosky *et al.*, 2011; Ceballos *et al.*, 2015; see also, Jones, 2014). The LPI argues that between 1970 and 2010 terrestrial species have declined by 39 per cent; freshwater species by 76 per cent and marine species by 39 per cent. In all, 82 per cent of this decline they attribute to a combination of exploitation and habitat pressure or loss. As Spash (2015a) pointedly reminds us, however, and a point we return to in the penultimate section, constructions of species loss may distract us from underlying causes and potential contradictions:

> […] statistical decline of species on Earth is another reminder of how humanity watches, observes and statistically enumerates the ongoing destruction […] the LPI is not a measure of life but rather the death toll relating to human appropriation of resources for human ends. Presenting death as life seems to fit well with the optimistic messages in the rest of the WWF report […] Meanwhile they treat Nature as capital that is valued for supporting production to provide new greener consumption possibilities and financial rewards. This is the economic discourse now common amongst the environmental non-governmental organisations. The contradictions of supporting extractivist capital accumulation and consumerism while wanting to conserve Nature are reconciled as easily as calling death life. (Spash, 2015a, p. 1)

Of course the statistical decline of species is disturbing and undesirable from almost any point of view one might enlist, but surely too is the fact that such accounts might aid our collective cognitive dissonance rather than shake us from our destructive ways (see also, Milne, 2007).

Biodiversity loss is only one component of planetary un-sustainability as we generally account for it and whilst climate change currently dominates sustainability discourse that should not be allowed to distract us from recognising that un-sustainability has many components – even from a purely anthropocentric point of view (Rockström *et al.*, 2009;

Speth, 2010). These include, alongside climate change and species extinction, such matters as reduced resources (for all species); pollution; inequality and oppression even within our species. Ceballos *et al.* (2015, p. 3) however argue, albeit anthropocentrically again, that:

> […] the most serious aspect of the environmental crisis is the loss of biodiversity—the other living things with which we share Earth. This affects human well-being by interfering with crucial ecosystem services such as crop pollination and water purification and by destroying humanity's beautiful, fascinating, and culturally important living companions.

Whilst it is arguably the case that for most of humanity, and indeed for most western narratives, the causes of this increasingly fragile state remain unconsidered, amongst informed commentators there is a perhaps surprising level of agreement about what is driving this level of extinctions. Kolbert (2014), for example, says "There are very few, if any, extinctions that we know about in the last 100 years that would have taken place without human activity" (in Drake, 2015), and WWF state "Unlike the mass extinction events of geological history, the current extinction challenge is one for which a single species – ours – appears to be almost wholly responsible"[13]. And whilst McKibben (2012) is somewhat singularly focussed upon climate change, his case for the complicity of humanity and its blatant inability to change is compelling.

Figure 1 offers a particularly graphic illustration (and an implied causality) of the general point we've been making (albeit one whose straightforward linear suggestion we may have to recognise as too simplistic). While human population has risen perhaps seven fold in the last 200 years, species extinction has risen perhaps 50 fold.

The interdependencies of species, habitats and, more obviously, ecosystems, has been well established (Goldsmith *et al.*, 1972). Pressure on any one species or upon any one habitat consequently engenders pressure on other species such that, in all probability, we should perhaps talk of, if not simultaneous, then co-endangerments or co-extinctions. Species and habitat are not isolated or independent (see Allendorf, 2010; Quinn, 2010; Rose, 2010)[14]. So to talk of the extinction of individual species is, in a sense, misleading: we should, rather, speak of the systematic threats to all species arising from humanity's failure to manage its own actions in such a manner that all species on the planet have an equal chance of survival[15]. The root problem is humanity's continual growth,

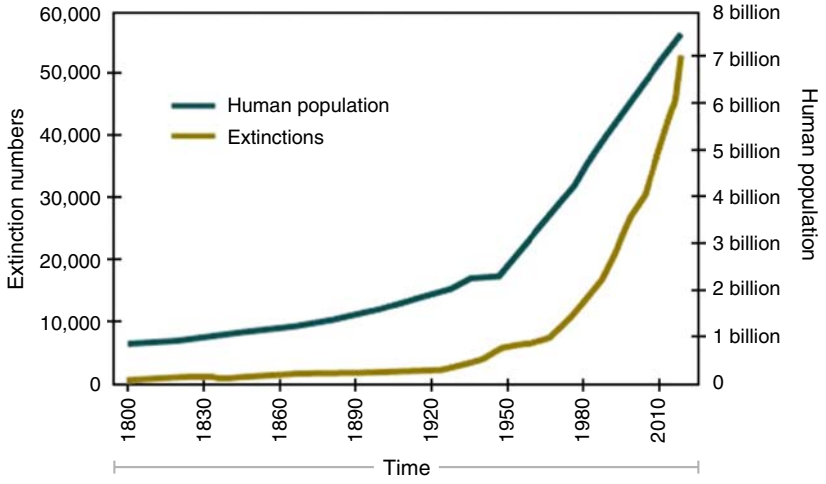

Figure 1.
Species extinction and human population

Source: Scott (2008)

its ever-expanding footprints, its movement of invasive species, its destruction of habitat, its change of the chemistry of the seas, its failure to deal with waste, its destruction of forests, its attachment to mono-culture agriculture and over-fishing and despite all of this, we still seem intent on increasing inequality and exploiting our fellow humans (see especially, Kolbert, 2014; WWF, 2016).

None of this should be a surprise to any semi-informed individual with access to data and information. We rehearse these points here primarily to encourage a more holistic interpretation of the (relatively) familiar data and to shift our purview from symptom to causes.

3. Accounts of humanity?

If we have plentiful, if disjointed and frequently ignored, accounts of species endangerment and if, as we contend, humanity's core complicity in this endangerment is vividly self-evident, then how do our narratives about ourselves, our species, reflect this? Hardly at all, seems to be the case.

It is clearly beyond our competence to fundamentally examine here humanity's understanding and representation of itself, but we arguably know a significant amount about how accounting, economics, modernity and capitalism, *inter alia,* mediate and change humanity's relations with itself/nature. Accounting's complicity in the creation and maintenance of the calculable person[16] (Boland and Schultze, 1996, Miller and O'Leary, 1987) is almost a commonplace in which simplified narratives have limited and constrained the actuality and possibilities of human/nature relationships. Essentially, humanity must first conceive of itself as different from "nature" and, from there erect the edifice of artificiality through which calculation and dominance over "nature" become (hyper) normal, (Vinnari and Dillard, 2016). It is no longer contentious to suggest that the economic project has been designed to render everything as either priced or worthless, visible or invisible (Thielemann, 2000). And such sentiments have been widely recognised in our field in works which expose the omissions of conventional accounts (see e.g. Hines, 1991; Gray, 1992; Milne, 1996; Broadbent, 1998; Shearer, 2002; Hopwood, 2009). Modernity has been a triumph of mankind over nature. And Daly (1998) synthesises all of this as he remarks upon mankind's obsession with investment in those matters which destroy humanity/nature; rather than directly in humanity or nature (p. 276).

But, somehow, our narratives of self fail to connect these insights (Hamilton, 2010). Perhaps the most widely adopted attempt to do so is that provided by Paul Ehrlich quite some time ago (Ehrlich and Holden, 1971, 1972; Ehrlich and Ehrlich, 1978). Ehrlich produced his famous heuristic that posited that environmental impact (I) was a direct function of human population (P), affluence (A) and technology (T). The heuristic has, if nothing else, stood the test of time and remains as good an indicator of the source of environmental endangerment as anything else of which we are aware (but see also, Demeny, 1998, p. 280 e.g.). If we follow Ehrlich's reasoning therefore, the impact on the planet, including species endangerment, is almost certainly a function of the number of human beings who collectively (stress "collectively") consume too much and who are in thrall to a technology and innovation process that generates as least as many bads as goods. That is – and this point cannot be stated often enough – species extinction, as with other examples of environmental degradation, is a systematic consequence of humanity and its current ways of organising[17].

It is a great deal more complex than this, of course. Population forecasts are exceptionally difficult (Billari, 2015) and, crucially, different populations have different impacts as a function of culture (Coleman and Basten, 2015) as well as a function of age and education (Lutz and Streissnig, 2015). Indeed, as Lutz and Striessing show, the composition of P has a direct impact on future levels and composition of P as well as on I, A and T. Further, as one commentator

remarked, the lazy assumptions of homogeneity in "population" fails to recognise that for many indigenous people, their worlds ended a long time ago and perhaps western modernity needs to learn how it turned its back on nature by learning from those who never, wittingly, did so[18]. And there is also a sense in which A and T are tautological in that they assume forms of affluence and technology which are modern, economic and western: there are many forms of technology and affluence which are no such thing (see e.g. Khor, 1957, 1978; Schumacher, 1973; Sale, 1980, 1985 and other proponents of intermediate technology and bioregionalism). What does seem clear, however, is that whilst our understandings of P gain much needed subtlety (Teitelbaum, 2015; Kreager, 2015; Lutz *et al.*, 2001), human stress upon the planet and other species urgently needs addressing. One persuasive articulation of this problem is that of "Earthfullness" (see especially Toth and Szigeti, 2015) in which the planetary capacity for photosynthesis is contrasted with humanity's increasing appropriation of this essential element of life: leaving less and less for other life-forms. As estimated by Vitousek *et al.* (1986, p. 372), "[…] organic material equivalent to about 40% of the present net primary production in terrestrial ecosystems is being coopted by human beings each year… and the vast majority of other species must subsist on the remainder". Given current levels of A and T, Earth is dangerously overfull of humans it seems (see also Daly, 1998). Humanity's exploitation of species for its own various purposes together with mankind's voracious appropriation and destruction of habitat and consumption of biomass/biocapacity sit at the core of any examination of species endangerment (Haberl *et al.*, 2004; Quinn, 2010; Jones, 2014; WWF, 2016). Wilson (2010, p. 22) puts it plainly "[…] civilisation was purchased by the betrayal of Nature".

If we reflect for one brief moment, we realise (at least a part of) humanity doesn't simply appropriate increasing amounts of existing biomass to subsist, and thus deny other species in a contest of life and death, we do so for lifestyle. Not only do humans fund those lifestyles on present levels of biomass, but also that from geological time. And, as we switch away from fossil fuels to renewables like solar, we will increasingly intercept the fundamental source of energy for other species, for the vast majority of life in fact. Indeed, Jacobson and Delucchi (2011) estimate the world's current human energy demands at about 12.5 trillion watts and that by 2030 humans will demand 17 trillion watts. They further estimate that total available solar power over land (between latitudes 50S and 50N) is 1300 trillion watts and, of that, 340 trillion watts is feasibly developable. This all sounds positive in a world of anthropogenic global warming, with a need to rid ourselves of fossil fuels, and reduce or avert the dire consequences of climate change on ourselves and other species. And, you might argue that appropriating 5 per cent of easily developable terrestrial solar energy by 2050 for humanity is no great burden on the rest of Earth's species. Yet given annual compound growth rates of 2 per cent for energy demand (the implied rate of growth from 12.5 tW to 17 tW by 2030) the limits of the easily available solar energy (i.e. 340 tW) would be reached in 170 years. On such a trajectory, the limits of all available terrestrial solar energy would be reached in less than 250 years. Switching fuels does not necessarily change our fundamental values, activities or beliefs: it simply changes the means employed to power them.

Accepting this inevitably over-simple analysis, we can nevertheless recognise that to speak of species extinction without *inter alia,* exploring profound changes/reductions in human population, substantial re-evaluation of production and consumption and a profound re-examination of our technology, its development, deployment, ownership exploitation is, in all probability, to rather miss the point. Indeed, to speak of accounting at all without speaking of species extinction is arguably to only speak most partially. Human reproduction, capitalism and business are, at a minimum, due for a fundamental reassessment. As Rolston III (2010, p. 71) puts it, will Earth's managers produce a sustainable development or a sustainable biosphere? It is only in the latter that we and a great many other species will survive. Humankind's apparent inability and/or apparent

reluctance to consciously address such issues – and, indeed, in doing so to render such consideration illegitimate – leaves us unable to break out of a potentially fatal immanence (Levitas, 2013, p. 10)[19].

Within the context of accounting, finance, economics and business – our presumed stock-in-trade – it seems perfectly plausible therefore that all that we do, teach, research and think are at the very heart of why species are going extinct. Certainly, it is patently obvious that the organisational accounts on which we tend to focus offer nothing substantive at all in terms of modernity's central complicity in un-sustainability, (Samkin *et al.*, 2014). At the extreme, if we wish to prevent species being further assaulted, perhaps we should stop doing what we do.

4. Accounts of human extinction

> […] However forward-looking we may pretend to be, humanity is far more interested in its past than it is in its future. (Leslie, 1996, p. vii)

In the majority of accounts of non-human species extinction, as far as we are able to assess, there are two striking omissions. The first omission we have referred to above: the failure to recognise that global human organisation is, in most cases, the root cause of accelerated species extinction. The second striking omission is that the concern with species extinction is not extended to the extinction of humanity. To extend our thinking to embrace human extinction would seem a very sensible mental exercise, if for no other reason than in recognition that with the extinction of humanity the rest of the planet's species could go about their normal business.

Human extinction should not be unthinkable[20]. All species, as far as we are aware, eventually face extinction (Ceballos *et al.*, 2015) and although humanity is a relatively young species (see footnote 10; Leslie, 1996) its vulnerability to potential extinction level events seems considerable. In addition to the "natural" events such as volcanoes, meteors and disease, humankind has added (what Bostrom, 2006; calls) existential risks such as anthropogenic climate change, chemical and biological warfare, environmental collapse, technological blowback including nuclear meltdown, financial and economic implosion etc., (McPherson, 2011b; Leslie, 1996; Auerbach, 2015). Indeed, the possibility/probability of our own (near) extinction is a matter that one might have thought was somewhat compelling to the modern scholar. But whilst there is important scholarship pursued in the nooks and crannies of academe (see e.g. Livi-Bacci, 2015; Morgan, 2009; Carpenter and Bishop, 2009), this work, as Bostrom (2006) observes, rarely enters mainstream debate and reflection.

Speculation on the matter of our own demise is not, as might perhaps appear to be the case, simply the domain of doomsayers, fear-mongers and madmen, (see especially Tonn and MacGregor, 2009; Tonn and Stiefel, 2014; Bostrom, 2009). Perhaps the most eminent such commentator is the late Frank Fenner, a world renowned virologist who helped eradicate smallpox and who states:

> Homo sapiens will become extinct, perhaps within 100 years […] A lot of other animals will, too. It's an irreversible situation. I think it's too late. I try not to express that because people are trying to do something, but they keep putting it off. Mitigation would slow things down a bit, but there are too many people here already (Jones, 2010; Sweet, 2010).

Others are more direct still. Both Leslie (1996) and Auerbach (2015) confront the highly disruptive prospect of humanity heading for extinction – possibly in current lifetimes – and McPherson (2011b) is characteristically direct when he says:

> About a decade ago I realized we were putting the finishing touches on our own extinction party, with the party probably over by 2030. During the intervening period I've seen nothing to sway this belief, and much evidence to reinforce it (McPherson, 2011b).

Attempting to be a little more analytical about the prospect and recognising that humanity is both very widespread and has a virus-like capacity for reproduction and survival, planet-killing events aside, the complete extinction of humanity is probably unlikely: it seems more likely that our concern here is with near extinction (Bryner, 1999; Diamond, 2005; Kolbert, 2014).

And here the arguments seem to divide into three broad themes: devastation of the human species through existential threats manifest through western ways of organising; selective exterminations through which those societies less in thrall to modernity may survive in some form or other; and the erosion of the quality of "humanity" – the loss of what it is to be human. We touch briefly on each of these below.

It is clear, to a considerable degree at least, that humanity's survival/extinction depends, instrumentally, upon the planetary ecology and biodiversity in particular. Reductions in biodiversity offer one of the major existential threats to humanity's well-being and continuance (Rockstrom *et al.*, 2009). And whilst this seems to be definitionally true, Kolbert (2014) argues that humanity has managed to survive to the twenty-first century with the loss of many species; it could probably continue to do so with the loss of yet more species. Whilst humankind's ingenuity seems unable to find ways to prevent our destruction of other species, it does continue to find ways to manufacture substitutes (proteins, plasma, etc.) which fill some of the gaps left by humanity's "stewardship" of the planet. Whether this could ever be sustainable is a matter of doubt but there is little question that such acts also increase the existential risks we face as a species (Bostrom, 2009). Rifkin (1980), for example, in contemplating the future of humanity sees two major paths forward, one in which we increasingly seek to exist in a world divorced from our place in the cosmos and become entirely reliant on synthetic substitutes – such a world, he suggests, is being promoted by powerful corporate elites. And another in which we accept planetary limits, fundamentally recognise the implications of the second law of thermodynamics, and adopt a moral imperative to preserve all forms of life for as long as possible[21].

Perhaps the most instrumental of the arguments employed to justify the maintenance of "nature" is that peculiar approach which values nature by reference to the economic "good" it (potentially) provides to (elements of) humanity, (see e.g. Helm, 2015; Juniper, 2013; Monbiot, 2014; Trucost, 2013; Stone, 1974). At its extreme this approach seems to reduce humanity and nature to purely economic existence: as if life has no meaning outside an economic nexus (see e.g. Roscoe, 2014; Sandel, 2012). Such reasoning is widespread and even work from the United Nations such as UN CBD COP10 (2010) argues for biodiversity on the grounds that it is an essential component of human health which is, in turn, an essential human right. And, as we noted earlier, Spash (2015a; see also Spash 2015b, 2013, 2011; Sullivan, 2013, 2014) has been a particularly outspoken critic of the colonisation of environmental issues and Nature by a discourse of economics and financial capitalism both within the profession of environmental economics and within the environmental movement more widely[22].

A more subtle argument – to our mind at least – is nicely captured by Caldwell (1999):

> Having abandoned reciprocity with the natural world in pursuit of command over it, modern civilization has broken an ancient covenant with nature…but until the present era, humanity and the living Earth itself were not threatened (p. 3).

That is, modernity has caused (enabled?) mankind to become distanced from the natural world of which it is a part and to ignore the signs of limits in the natural world that we do not (yet?) fully understand[23]. This view resonates strongly with Rees' thesis in which he contends that "[…] technical advances will in themselves render society more vulnerable to disruption" (p. 21). Both Caldwell and Rees therefore join a long line of commentators (see e.g. Leopold, 1949; Passmore, 1980) that suggest that humankind is not just at risk in its

separation from its essential self but has abandoned its "species being" and might no longer be the humanity about which we choose to give accounts. Perhaps our humanity has already been lost. (We return to this shortly).

Caldwell's argument above stirred up considerable interest at the time and led to a special issue of *Politics and Life Sciences* and this, in turn, introduces our second theme of extinction. That is, Caldwell, in common with many of the commentators cited here, is largely focussed on western modernity when, in fact, societies are clearly not homogeneous and many non-western societies may be less vulnerable to the threats of extinction – assuming of course that western international financial capitalism has not completely destroyed their basis of life (Elliott, 1999). Such observations seem to reinforce the need for holistic perceptions and recognition of the systematic violence of western modernity whilst offering a glimmer of hope that some non-western societies may be less vulnerable to near extinction threats.

It seems inescapable to us that such reflections raise the third of our extinction themes: namely the imponderable questions of what it is to be human and, at its most unthinkable, whether the humanity of western international financial capitalism and the utopian visions of neo-liberalism that populate, *inter alia,* the halls of accounting, finance and economics remain worthy of the title "humanity". Might we speculate, perhaps, that any notion of an aspirational, spiritual, humankind – in western contexts at least – is already near extinct? Such dystopian memes are clearly visible in so much of the commentary we have reviewed here. Commentators such as McPherson (2011b), Leslie (1996), McKibben (2012), Kolbert (2014) and Ceballos *et al.* (2015), all seem to be able to confront the notion that, as a species, humanity no longer has any claims to legitimacy. As we read these exegeses, they are so much more than fantasies of Christian original sin and a yearning for redemption. Rather they speak to us of an inchoate reaching for some means of articulating and understanding the accounts of humanity on which our histories and selves are built: but they do so whilst gripped by a sense that those aspirational, inspirational accounts may indeed be accounts of either another species than humanity or of a species of humanity which no longer exists (see e.g. Katovich, 2010).

This collective ennui is, ironically perhaps, at its most alive and well in the Voluntary Human Extinction Movement who state:

> When every human chooses to stop breeding, Earth's biosphere will be allowed to return to its former glory, and all remaining creatures will be free to live, die, evolve (if they believe in evolution), and will perhaps pass away, as so many of Nature's "experiments" have done throughout the eons […] It's going to take all of us going. www.vhemt.org/aboutvhemt.htm

It falls to Latour (1998) to offer what is possibly the most subtle (if difficult) articulation of this issue of humanity and why, arguably, humankind seems unable to embrace arguments which drive to the heart of "nature". Briefly, Latour (1998) argues that "political ecology cannot be inserted into the niches of modernity. On the contrary, it requires to be understood as an alternative to modernization" (p. 222). This is, essentially, because all aspects of ecological argument in the political domain have ended up appropriated by various (commercial, domestic etc.) incompatible discourses of modernity which (definitionally) have nothing to say about "nature". Consequently, in this reading, ecology as manifest in the political domain has nothing to say about nature. Nature, Latour (1998, p. 236) argues, represents a higher unity of which mankind may be included if, and perhaps only if, our "common humanity" can be abandoned:

> […] we do not know what makes the common humanity of human beings and that, yes, maybe, without the elephants of the Amboseli, without the meandering waters of the Drôme, without the bears of the Pyrenees, without the doves of the Lot or without the water table of the Beauce they would not be human.

The essence, if we follow correctly, is that (following from Kant) humanity is both means and ends and that, for a true ecology, nature must be thought of similarly: a river is not a

tool, it is both a means and an end and exists outside any human context, (see also, Vinnari, 2013). In terms of our arguments above, we understand this to suggest that humankind has not just abandoned its humanity to modernity but must find a new notion of self, subsumed within nature. This, in turn, sounds to us like a (potentially romantic) appeal to the conceptions of aboriginal and indigenous peoples with all that this could entail.

It seems to us that accounts of human extinction are essential if accounts of other species endangerment are to be addressed seriously: species extinction is fundamentally inseparable from humanity's existence and humanity's putative extinction. Humanity, it seems to us, has relatively few such accounts (beyond e.g. Biblical accounts of the Flood). This repertoire of accounts we would wish to see expanded and made more common so that the unthinkable (human culpability and vulnerability) can become thinkable. In this, reflecting upon accounts of humanity's extinction might be thought of as no more than the ultimate proposal for social, environmental and sustainability accounts: accounts which at their best expose and make the unthinkable, thinkable, (Jones and Solomon, 2013; Atkins *et al.*, 2015; Gray *et al.*, 2014).

Conscious that such suggestions might appear to be essentially dystopian (although we might commend McPherson (2011a) and Hamilton (2010) in this context) we return to Levitas' call to utopian thinking and pick up Rees' challenge that we must start to build plausible rigorous narratives – not the self-deluding lotus-eating nonsense of corporate sustainability and progress – but accounts of how some future for humanity might be found in a way which pays a great deal more respect to both non-human species and to those parts of the human species who suffer for the hubris of the rest of us.

5. Utopias and dystopias

> If utopia is a space for the fictional resolution of problems that humankind has not (yet) solved, incommensurability can only enter as a dystopian shadow. (Levitas, 2013, p. 120)

The late Donella Meadows did not simply understand that there are limits to growth and that humanity was pressing up against them, she also understood that in changing (human) systems the greatest challenges lay in the systems' goals, and the mindset out of which the systems, their goals, power structure, rules, and culture arise[24]. For Meadows, the greatest leverage point lay in transcending that mindset. It seems that new stories, narratives, accounts, are essential if humans are to be helped to imagine the currently unthinkable, (Atkins *et al.*, 2015). To a considerable degree, it seems as though western, modern humanity does not (currently) possess the necessary imagination to conceive of a possible future in which humanity is steadily taken to a state of near extinction or the imagination to conceive of a world where humanity renews, what Caldwell (1999) called, our reciprocity with the natural world: to imagine what a path towards a state of grace might look like. That gap in imagination can be filled by a variety of endeavours: new accounts (as we accountants might choose to understand them) is one; stories, music, film, poetry and other cultural communications are others which satisfy the need that a society has for new narratives when faced with substantial upheaval (Norminton, 2013, p. vii). Other commentators reinforce this notion: so, for example, Benking (1999), in one of the responses to the Caldwell piece, calls for more attention to the "… pictures and icons we use to paint and communicate possible futures" (p. 203) whilst the novelist Ursula LeGuin says "Resistance and change often begin in art. Very often in our art, the art of words"[25].

Trying to identify utopian possibilities, the instinct for "utopia as method" as Levitas calls it, is not an easy exercise, (see also Atkins *et al.*, 2015). One particularly striking illustration looks a lot like an exception which proves the rule. Norminton (2013) states that:

> We have a duty to imagine what we fear to look at, for in looking away we fail, not only to avert the worst for our children, but also to create the happier and more just society in which we

> wish them to live. More than ever we need stories that tell us where we stand, that help us imagine our predicament (p. ix).

This quotation from Norminton is part of the introduction to a specially commissioned set of texts, stories, poems and reflections, because, as the editor and collaborators note, there are so few such accounts and we need them so badly.

Why there might be this dearth of imaginative and desirable narratives of new possibilities is probably very complex. Fear of confronting that which we find uncomfortable or outside the current acceptable orthodoxy is, as we have seen, offered as one explanation, (see also Hamilton, 2010; McPherson, 2011a). Giampietro (1999) offers a very challenging further possibility when he addresses the notion of the way in which modern western mankind is encouraged to think and the ways in which universities in particular favour and reward only certain types of intellectual endeavour. In particular, Giampietro identifies normal science as a major part of the problem – not the solution that a technocratic world seems to encourage. Normal science privileges analyses of the present over any possibilities of the future and in its constrained conceptions of knowledge misses both the holistic possibilities of a wider-ranging intellect and, in the process, also misses the lived reality of much of humankind. As Vucetich, an ecologist, (2010, pp. 340-342) suggests:

> One kind of [scientific] knowledge helps us do things in the world – helps us conserve nature, restore damage, and live sustainably […] However, the knowledge that helps us do good things can also be used for the most disgraceful endeavours […] Knowledge that can change our attitude about nature is the second, and more important, kind of knowledge […] When we decide that the purpose of science is to generate wonder about nature, rather than control nature, we will not be far from a relationship with nature that can flourish for all time and generations.

In a similar vein, Callicott (2010, p. 361, – see also Midgley, 1983; Singer, 1976/1996) challenges us to modify our ethical approaches away from a purely rational concern for the welfare of individual human beings and towards the biotic community. He stresses a need for our ethics to recognise mutualism, reciprocity, and to connect to our essential emotional selves:

> Ethics, as the contrarian philosopher David Hume observed, is rooted in moral sentiments – other-oriented feelings of love, well-wishing, loyalty, patriotism – not in reason alone. And as Charles Darwin argued, the moral sentiments are naturally selected to facilitate the existence of cooperative societies. The ethical paradigm that meets the challenge of global climate change must shift the emphasis of moral psychology from reason to feeling[26].

Kellert (2010, pp. 376-378, see also Kellert and Wilson, 1995, and in accounting see Broadbent, 1998; Shearer, 2002) makes two striking observations concerning our attempts to invoke our emotions in developing and articulating closer connections with nature. First, loving nature, delighting in its beauty, and remaining in awe of it are just as essential human motivators in seeking to sustain nature as are concerns over its utility to provide goods and services. And, second, and despite the first, there remains a mindset that such concerns are impractical and romantic preoccupations lacking the realism of motivators for material gain, or avoidance of catastrophe. Leopold (1949, p. 198) could only see one force behind conservation that had the power to reach into all times and places, one force that could unify concern for land as an organism: not profit, not government, not sport, but "love for and obligation to that great biota".

These compelling suggestions have echoed through social science scholarship for years (see e.g. Ackoff, 1972; Gray and Milne, 2015; Bebbington and Larrinaga, 2014).

One further compelling possibility as to why we have so few enlivening new narratives of possibility is perhaps the most disturbing. Levitas (2013, p. 10) is not alone in arguing that it may be that it is dystopia, rather than utopia which seems to be a more appropriate concept for the times. The sheer volume of dystopian novels and films[27] seems to speak of

a culture no longer able to conceive of a desirable "other" except through the lens of corporate dominance and neo-liberal excess:

> But if the critical dystopia can be a vehicle of resistance, it is much less able to register transformation and redemption. It may point to the exit but it does not suggest what we might find, or make, when we leave. (Levitas, 2013, p. 111)

And this leaves us, as Atkins *et al.* (2015) suggest, in need of guidance from, for example, writers and activists of the past who held and manifested possibilities for liberating futures.

Our lack of new accounts – and therefore our need for new stories –is at its most clear in the uncompromising but brave initiative known as the Dark Mountain Project. They state:

> We live in an age in which familiar restraints are being kicked away, and foundations snatched from under us. After a quarter century of complacency, in which we were invited to believe in bubbles that would never burst, prices that would never fall, the end of history, the crude repackaging of the triumphalism of Conrad's Victorian twilight — Hubris has been introduced to Nemesis. Now a familiar human story is being played out. It is the story of an empire corroding from within. It is the story of a people who believed, for a long time, that their actions did not have consequences. It is the story of how that people will cope with the crumbling of their own myth. It is our story.
>
> We imagined ourselves isolated from the source of our existence.
>
> Humans have always lived by stories, and those with skill in telling them have been treated with respect and, often, a certain wariness. Beyond the limits of reason, reality remains mysterious, as incapable of being approached directly as a hunter's quarry. With stories, with art, with symbols and layers of meaning, we stalk those elusive aspects of reality that go undreamed of in our philosophy. The storyteller weaves the mysterious into the fabric of life, lacing it with the comic, the tragic, the obscene, making safe paths through dangerous territory.
>
> We believe that the roots of these crises lie in the stories we have been telling ourselves. We intend to challenge the stories which underpin our civilisation: the myth of progress, the myth of human centrality, and the myth of our separation from 'nature'. These myths are more dangerous for the fact that we have forgotten they are myths. ("Uncivilisation: The Dark Mountain Manifesto" available at: http://dark-mountain.net/about/manifesto/)

David Korten's (2015)[28] report to the Club of Rome seems to wholeheartedly embrace the conclusions reached by the Dark Mountain Project. Korten (pp. 23-27) seeks to explode the "sacred money and markets story", in which money is king. This story has, he argues, gripped modern society for too long. Under this story Earth is dead rock populated by money-seeking robots. Money has become "[…] society's object of worship…life's purpose, shopping a civic duty, markets our moral compass, institutions of finance our temples, and economists the priests […]" Under this story, nature and people are simply means pressed into the service of money and their money-seeking robots (corporations), with lavish benefits for a few who serve them and dire consequences for the majority of people and life. The story will be familiar to us all, not least because, as Korten notes, it is the story we tell time over, year in and year out, to our students. It is a story that most of our graduates will spend most of their lives reinforcing. It is the story that is bound up in the myth of progress.

Korten's (pp. 30-36) response is that in order to change the future we must change the story. He seeks to supplant it with a new myth, to reframe our worldview with one that will obviously resonate with many indigenous peoples, and one that (notwithstanding Kellert's observation) seeks to engender hope and optimism – the "sacred life and living Earth story". Under this story, life is king. Human beings are nurtured by a living Earth. Wealth is living wealth. Life exists in a living community, and the essential task is to maintain the conditions of life for its members – human and non-human. "A connection to nature and community is essential to our physical and mental health It is our nature to care and share for the benefit of all" (p. 30). Under this frame, individual greed, ruthless competition, environmental damage and extreme

inequality indicate inhumanity: they are signs that we have lost touch with our nature, and provide signs of a sick society and a dysfunctional system. They are signs we are headed for extinction, and in many ways have already got there.

6. Conclusions and reflections

Our principle purpose in this short essay has been to try and add a counter-narrative, a counter-account, to the mostly excellent literature that is building around accounts of species extinction, biodiversity and possibility/utopia. This narrative is self-consciously designed to sit within the context of the *AAAJ* special section on extinction accounts. Accounts of endangerment and extinction very properly engage us in the process of exploring how such threats might be explained, overcome, mitigated or even reversed. However, our primary challenge here is to suggest that we must balance all such accounts – i.e. accounts about symptoms – with meta accounts about causes. In that sense, this essay might be seen as a (counter) account for counter-accounters. Such an account, hopefully, might: offer an alternative account to those concerned with specific species' endangerment; encourage wider consideration of context in the act of species accounting; and suggest that a very proper lens of species accounts might embrace an analysis of threats to human continuance. Indeed, such hopes bring us to the edge of the work of Mouffe and of Latour (Vinnari and Dillard, 2016) in which multiple accounts, including those which embrace nature as actor, offer one, albeit complex and contentious route to generating new accounts that may escape the essential problems on singularity and immanence[29].

The problem of species extinction is, in all probability, a problem with humankind and its modern ways of organising – most obviously through international financial capitalism. It is a problem of spirituality, growth, profit, consumption, individualism and the pursuit of more. It is a problem rooted in the very essence of our craft and the very core of our being, (Hamilton, 2010). What we need are honest and penetrating accounts of humanity that sit alongside imaginative new accounts of a selfhood that is part of – and that renews its covenant with – nature, (see also Vinnari and Dillard, 2016). For this we need accounts that challenge our sense of modernity and which, as Bostrom (2009) so eloquently argues, and Korten (2015) pursues, change the stories we tell ourselves about ourselves and about new and more admirable possibilities.

The seeds of these new accounts are emerging in the accounting and management literatures as we see managers struggling to make sense of environmental issues (Hill and Thompson, 2006) and organisational disclosure struggling to reconcile the irreconcilable notions of nature as commodity and as of intrinsic worth. These conflicts seem to us essential – much that we have seen here is irreconcilable and the essential senses of modern western self must be challenged, (Vinnari and Dillard, 2016). And for this, we endorse Atkins *et al.*'s (2015) commending of utopian and visionary possibilities. We need the imagination that lets us see that for species to have any reasonable chance of survival, humanity must regain its integrity, rediscover its covenant with nature and offer accounts of a future worthy of our attentions.

There are wider implications that we think we may be able to draw from the essay – implications most notably about social, environmental and sustainability accounting. These reflections lead us to acknowledge more explicitly the way in which most of the accounts that we recognise, construct or critique are essentially immanent. They either are produced by powerful organisations who essentially lie at the heart of the sustainability and species problem or they are produced by individuals and groups in response to issues but, as we have already stated, self-disciplining seems to suggest that we tend to fold the "accounts" into some realm of the acceptable when the essence of the problem may well be the implicit and self-disciplining constraints within which the account is couched. Thus, we may come to recognise that all accounts with which (social) accounting

is generally concerned are essentially very partial reflections of humanity but with very little serious consideration of what that humanity might mean for the terms and contents of the accounts themselves. The terms under which the account is produced and under which we critique other accounts are, in all important ways, set for us in ways in which, typically, we do not explicitly consider. Precisely how we might escape from this immanence is not obvious although two possibilities suggest themselves for further exploration. First, we might speculate that, at a minimum, any substantive account might be expected to challenge the existence and purpose of the core elements of the organisation, cause, phenomenon or characters about which the account is most immediately concerned. Second, more detailed exploration of the possibilities suggested by dialogic and agonistic accounts is an increasingly substantive suggestion within the literature, (see e.g. Brown and Dillard, 2013; Vinnari and Dillard, 2016).

Stories/accounts are what we live by, we create them and they, in turn, create us: much as Barthes (1957/1972) recognised, deeply embedded stories act like myths holding a vice-like grip on our lives. Despite this, they are not immutable: they do, and can be changed. And in doing so, humans can change. It is clear to us we need to, and we must try. Whether we will, is a more open question. There is a certain irony in the Dodo being humanity's poster child for extinction. The Dodo, if our story is correct[30], inhabited Earth for over 25 million years. In its last home on a remote island in the Indian Ocean, it had become sufficiently comfortable to shed the need for flight and escape. What of homo sapiens? We have inhabited Earth for less than a few hundred thousand years, and also inhabit a home in a remote ocean of space. Yet, we appear far from settled, comfortable and ready to forsake the need to escape.

Notes

1. This quotation is part of a letter Einstein sent to Robert S. Marcus on the death of his son from polio. The original ended with the sentiment. "The striving to free oneself from this delusion is the one issue of true religion. Not to nourish the delusion but to try to overcome it is the way to reach the attainable measure of peace of mind".
2. The Dodo as the *cause célèbre* for human-caused extinction (Cheke and Hume, 2010; Hume 2006) seems to have been an accident of history (Turvey and Cheke, 2008), especially since other extinct species were equally subject to human barbarism (e.g. the Great Auk). As Turvey and Cheke (2008, p. 159) note, the human-centredness, sense of superiority and even stupidity knew few bounds and they identify (in Strickland and Melville, 1848) an apparent inability to take any agency in the specie's extinction, rather noting: "the duty of the naturalist to preserve to the stores of Science the knowledge of these extinct or expiring organisms … so that our acquaintance with the marvels of Animal and Vegetable existence may suffer no detriment by the losses which the organic creation seems destined to sustain".
3. And see also Vinnari (2013) for a further and accessible insight into Latour's possibilities in this regard.
4. The term "closeness" is developed in Gray *et al.* (2014) to relate to the idea that the closer individuals and groups are physically, intellectually, professionally and in terms of their values the less formal need be the mechanisms of accountability and the more informal will be the accounts. The discharge of accountabilities can arise casually or even non-verbally between peoples. Appropriate accounts may well engender closeness as opposed to traditional financial accounting which engenders distance and formality – or non-closeness perhaps.
5. www.socialsciencespace.com/2014/01/roberto-mangabeira-unger-what-is-wrong-with-the-social-sciences-today/
6. For a detailed explanation of Marx's concept of species being, see for example, Ollman (1976, pp. 150-153).

7. In this regard, we are anticipating that the predominance of papers in this special section will be focused on the experiences with particular habitats and particular species. It is in this context that we make this comment.
8. "Our" time on Earth, of course, is a variable notion. Of the 4.5 billion years Earth is believed to have existed, as a species *Homo sapiens* (modern man) has been here perhaps 200,000 years; 'agricultural man' is but 10,000 years old, 'metal working man' 5000 years old, and 'industrial man' but a few hundred years old (www.newscientist.com/article/dn9989-timeline-human-evolution/).
9. Whether such "accounts" are accounts as an accountant might typically understand them it is clearly a moot point. However, we choose to locate this work in the context of: the breadth of accounts that concern social and environmental accounting; the narratives of sustainability debates (see e.g. Grey, 2010); and the accounts concerned with species extinction with which this special section is concerned. Accordingly we do not directly address this wider complex matter here.
10. Mitchell (2015) is careful to problematise the notion of extinction to avoid some notion of its inevitability and to re-establish some notion of human relationship and responsibility for the ethical content that clusters around such events.
11. Barnosky *et al.* (2011) raise the question as to whether we are already in a period of the sixth mass extinction. They state that palaeontologists characterise "mass extinctions" as events when Earth loses more than three quarters of its species in a geologically short time interval. This is believed to have happened only five times in the past 540 million years.
12. http://wwf.panda.org/about_our_earth/biodiversity/biodiversity/ is careful to emphasise that measurement and accuracy are extremely difficult in this area but that, regardless, the rates of loss are well in excess of any conceivable measurement error.
13. http://wwf.panda.org/about_our_earth/biodiversity/biodiversity/
14. As John Muir famously put it "When we try to pick out anything by itself we find that it is bound fast by a thousand invisible cords that cannot be broken, to everything in the universe.
15. We stress the point here about species having a chance. As Foreman (2010, p. 101) notes, Aldo Leopold crafted his "land ethic" – A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise – from a Darwinian worldview. The implication is clear: humans could no longer be the conquerors and lords of the land community but must become citizens in it. And this, of course, is a worldview not simply attributable to Leopold. It resonates in indigenous cultures (see e.g. Tinker, 2010) and Buddhist philosophy (Allendorf, 2010).
16. The notion of the calculable person derives from the observation that our individuality is no longer either beyond knowing or unique but rather it can be known: that is mapped, calibrated, evaluated, quantified, predicted and managed. Accounting is a major component in the construction of this knowing.
17. The role(s) of accounting in these ways of organising, as in the ways of organisations, needs no further development here, (Miller and O'Leary, 1987; Gray, 2013).
18. Aaron Vansintjan at http://entitleblog.org/2016/03/01/going-beyond-the-ecological-turn-in-the-humanities/
19. The point being made here is that the possibility (to our mind, actually, probability) that the achievement of any substantive notion of sustainability can only be conceived of by stepping outside the normal assumptions of capitalism, growth, population etc. is too frequently excluded from discussion. From, what Jones (2014) calls the "Overton window". Accounting's significant implication in this conservative take on the challenges of sustainability are relatively self-evident (Bebbington and Larrinaga, 2014; Byrch *et al.*, 2015; Milne *et al.*, 2009).
20. If for no other reason than common (if not always accurate) human narratives of prior apparent (local) extinctions like that associated with Easter Island. See, for example, Diamond (2005).

21. This latter position recognises that in Earth's future the Sun's energy is ultimately finite, albeit in the very far distant future, and ultimately all life will cease to exist. Furthermore, when energy is used by one life form, because of the second law of thermodynamics (entropy) it is degraded and less available for another. To preserve the process of life for as long as possible, Rifkin believes we have a moral obligation to pursue our existence drawing down the least necessary amount of energy.
22. Accounting – and even environmental accounting – has been subject to similar critique (see, for example, Cooper, 1992; Gray, 2013).
23. This distancing, increasingly driven by urbanisation and technology, may manifest itself in numerous ways such as lack of basic knowledge of sources of food and a lack of interest in natural life (Pergams and Zaradic, 2006; Zaradic and Pergams, 2007; Kareiva, 2008) in which modern humanity exists in an insular, self-referential and synthetic world lacking ecological awareness, consciousness and literacy.
24. See, for example, http://donellameadows.org/archives/leverage-points-places-to-intervene-in-a-system/
25. Ursula K Le Guin's speech at National Book Awards: 'Books aren't just commodities' www.theguardian.com/books/2014/nov/20/ursula-k-le-guin-national-book-awards-speech
26. Midgley (1983, pp. 89-97) makes a similar argument, and acknowledges that classical Utilitarians like Mill and Bentham, who strongly influenced thinkers like Peter Singer, were compassionately concerned not with an entity's ability to reason, but its capacity for equal suffering. See also Roberto Unger www.socialsciencespace.com/2014/01/roberto-mangabeira-unger-what-is-wrong-with-the-social-sciences-today/
27. See, for example, Cavna (2016) www.washingtonpost.com/news/comic-riffs/wp/2016/03/21/as-divergent-allegiant-dips-have-we-reached-the-fatigue-point-with-ya-dystopian-films/
28. An abridged online version of this work can be found here: www.yesmagazine.org/pdf/kortennewstory.pdf
29. We are grateful to one of the referees for this suggestion but have not explored its complex and significant implications here as to do so would change the essential nature of this essay and take us into more contentious issues of ontology than we care to embrace at this point.
30. See, for example, Shapiro *et al.* (2002).

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