# Deep Pasts – Deep Futures

## A Palaeoenvironmental Humanities Perspective from the Stone Age to the Human Age

Felix Riede

### Abstract

Coagulating around the notion of the Anthropocene – the proposed geological epoch of the 'Human Age' where anthropogenic control of and impact on nature has taken on a magnitude comparable to geological forces – many traditional humanities disciplines are rediscovering the environment as worthy of study. The emerging environmental humanities are dismantling the founding divisions of academic practice that have been confining the study of 'nature' to the natural sciences and the study of 'culture' to the humanities. Indeed, one of the environmental humanities' most central contributions has been addressing the question of ethical involvement when it comes to environmental research that has relevance in contemporary climate change debates. With its long-standing multidisciplinary affiliations and its many outstanding case studies of how the climates of the deep past have affected contemporaneous communities and how these communities have shaped their environs at various scales, archaeology is well positioned to make a contribution here. Yet, the discipline has been marginal in these emerging debates. I attempt in this keynote paper to bring together thoughts about the national framing of archaeological practice, archaeological interpretation and heritage management in Europe with preoccupations about past societal collapse under the umbrella of environmental ethical concerns. I argue that archaeologists should involve themselves in the wider environmental humanities project – and attempt to show how – but caution that due diligence is needed when operating in such a politically charged debate.

*Keywords: environmental humanities, climate change, archaeological ethics, transformation, collapse, Anthropocene*

Centre for Environmental Humanities and Department of Archaeology and Heritage Studies, Aarhus University
Email: f.riede@cas.au.dk

## Introduction

As I prepare this paper, the Intergovernmental Panel on Climate Change (IPCC) releases its landmark report – characterised by unusually strong and urgent wording – on 'the impacts of global warming of 1.5° C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty' (see IPCC 2018). The media widely hailed it as an important clarion call – yet another one – for concerted climate action in our time. Likewise, the United Nations Climate Change Secretariat (UNFCCC) also hastens to underline the report's importance:

> According to the IPCC's report, limiting warming to 1.5° C is possible, but requires unprecedented transitions in all aspects of society. Over the next 10 to 20 years we must transform our energy, agricultural, urban and industrial systems, engage non-state actors, and integrate climate action into the broader public policy framework that also addresses jobs, security and technology. (UN Climate Statement)

While jobs, security and technology are all important elements of such anticipated societal change, the IPCC report as well as the UNFCCC statement fails to seize the opportunity to argue for more comprehensive societal action across a wider spectrum of sectors. The IPCC has since its inception and later rise to media attention from the 1980s and onward become a critical policy-influencing actor. Yet, the IPCC has also been charged with being too narrowly focused in its disciplinary scope and with the closedness of its internal processes on numerous occasions (Corbera et al. 2016; Hulme 2012; Hulme & Mahony 2013; Nielsen & Sejersen 2012). Furthermore, it has been noted that the IPCC, despite all the media attention it commands, has not directly led to appreciable behavioural changes. Carter and van Eck (2014) blame this on the relentlessly global and abstract nature of its science and the lack of clarity regarding local relevance and downward causation. They argue that what is needed in addition to robust climate science are powerful narratives offering not merely effective science but also affective relations (see also Menning 2018; Pancost 2017; Nikoleris et al. 2017).

This paper is an essay more than anything else, and it is quite personal. It is also a modified version of my inaugural lecture taking up a professorship with special responsibilities[1] in the environmental humanities and the

1 In Denmark, a 'professorship with special responsibilities' is a particular job category. It is a time-limited professorship ranked lower than a full professorship; it is limited initially to five years and to a maximum of eight.

archaeology of climate change and extreme events at Aarhus University's Department of Archaeology and Heritage Studies. Against the background of recent and ongoing climate change concerns and debates, I here make the factful but no less compassionate argument that archaeology – and heritage more broadly – can be key contributors to the 'unprecedented transitions' that the UNFCCC has called for. I see these transitions as requiring concerted action across *all* sectors of society. At the same time, archaeology has a *unique* contribution to make, I argue, because it connects – *qua* environmental archaeology and geoarchaeology – with the climate and environmental sciences; it also connects – *qua* the discipline's embeddedness in cultural heritage, identity-formation processes and the museum interface – with the production of salient nature-culture narratives; and it also connects – *qua* its engagement in the educational and sector – with the potential for fostering long-term societal change through the social transmission of actionable cultural information and know-how.

## Archaeology as palaeoenvironmental humanities

With roots in earlier environmental movements and the writing of, amongst others, Rachel Carson (1962) and Aldo Leopold (1949), the last decades have seen the emergence of the so-called environmental humanities. Although some scholars dismiss this new field as an opportune intellectual fad *du jour* (Braidotti 2018), it has nonetheless garnered much attention in the form of dedicated journals, conferences, symposia, and earmarked funding – all trappings of an increasingly well-established sub-discipline are in place. In a nutshell, the environmental humanities are based on the conviction that humans, like all other animals, are part of ecosystems and that climate and the environment – as well as their changes in the past and the present – are issues worthy of detailed humanistic attention. Bergthaller and colleagues (2014:261), in a paper titled 'Mapping Common Ground: Ecocriticism, Environmental History, and the Environmental Humanities' put it this way:

> The emergence of the environmental humanities presents a unique opportunity for scholarship to tackle the human dimensions of the environmental crisis. It might finally allow such work to attain the critical mass it needs to break out of customary disciplinary confines and reach a wider public, at a time when natural scientists have begun to acknowledge that an understanding of the environmental crisis must include insights from the humanities and social sciences.

At a time when the humanities are under pressure almost everywhere for their perceived lack of societal contribution, a return to concerns of climate and the environment infuses that research with immediate relevance –

especially when coupled to the openly ethical engagement of humanistic scholars with their topic. It is this new relevance which in turn allowed key proponents such the prolific and influential Mike Hulme, formerly Professor of Climate and Culture at King's College London, now Professor of Human Geography at Cambridge University, to argue so powerfully in high-impact publications such as *Nature Climate Change*, that the humanities need to be taken seriously in this broad field of study (Hulme 2011). Note, however, that Hulme's snapshot of humanistic disciplines producing relevant climate and environmental knowledge does not include archaeology (table 1). This mirrors Berthaller et al.'s (2014) discussion of the environmental humanities – note the title of their paper cited above – whose focus rests entirely with the study of literature, history and the finer arts. Why could this be?

Archaeology has long been concerned with the environment, with robustly established sub-disciplines such as geoarchaeology or environmental archaeology reflecting archaeology's interdigitation with relevant neighbouring disciplines. The definition of such approaches and with it their intellectual stances and research designs are, however, much more closely aligned with the natural sciences than the environmental humanities; they are fundamentally comprised of 'the application of the geosciences to solve research problems in archaeology' (Pollard 1999:7). There are also, I sug-

Table 1. Humanities and social science journals with special issues on climate change, as offered by Mike Hulme in the inaugural issue of *Nature Climate Change* in 2011. Many such issues and dedicated anthologies have been added since but archaeology remains peripheral to the environmental humanities.

| **Discipline** | **Journal** |
|---|---|
| Anthropology | *Anthropology News* 48 (2007) |
| Communication studies | *Science Communication* 30 (2009);<br>*Environmental Communication* 3 (2009) |
| Ethics | *Environmental Justice* 2 (2009) |
| Historical geography | *Journal of Historical Geography* 35 (2009) |
| History of science | *Osiris* 26 (2011) |
| Literary criticism | *Oxford Literature Review* 32 (2010) |
| Museum studies | *Museum and Society* 9 (2011) |
| Philosophy | *Journal of Social Philosophy* 40 (2009);<br>*The Monist* 94 (2011) |
| Psychology | *American Psychologist* 66 (2011) |
| Religious studies | *Journal for the Study of Religion, Nature and Culture* 6 (2012) |
| Social sciences | *Contemporary Social Science* 9 (2014) |
| Sociology | *Theory, Culture and Society 27* (2010);<br>*The Sociological Quarterly* 52 (2011) |

gest, more overarching and plainly institutional reasons why archaeology has not been at the core of the environmental humanities movement: outside of Europe, the institutional placement of archaeology varies between the social and natural sciences. The environmental humanities developed most strongly in the US, leaving archaeology by and large behind. Yet more importantly and much more substantively, the environmental humanities are generally related to postmodern theoretical approaches, placing them far away in preferred terminology, method and interest from those archaeologists naturally drawn to the methods of the environmental sciences. Add to this the internal division of archaeology by chronology, and we stand with a situation where environmental archaeologists work primarily in deep prehistory using processual, ecological and evolutionary frameworks and where historical and contemporary archaeologists tend not to be too interested in issues to do with the environment (cf. Shanks & Tilley 1993).

These are broad generalisations, which despite rallying calls for greater attention to dimensions of social justice, to public archaeology and to nature-culture interactions (Hudson et al. 2012) persist, I would argue, to this day. Many of us may be able to recognise these fuzzy borders in our own institutions, where they retain reality in teaching, in research clustering and publication strategies (Jørgensen 2015). Encouragingly, some environmental archaeologists are seizing the opportunity to engage with the environmental humanities on their premises (Richer & Gearey 2017a, 2017b), while an increasing number of historical environmental studies are being published that take an explicit interest in the environment, and which also articulate directly with the broader trend of the environmental humanities and contemporary concerns of climate and environmental change (e.g. Souza & Costa 2018; de Keyzer 2016). The post-colonial historian Dipesh Chakrabarty (2014, 2009) astutely observed that the histories of consumption, of capitalism and of contemporary climate quandaries are conjoined. His 2004 paper in particular represents a personal reflection of a practitioner who had spent most of his career committed to understanding the politically charged entanglements of post-colonial history, i.e. a practitioner whose concerns are *prima facie* most closely aligned with contemporary or historical archaeologies. Yet, he argued that – here in this Human Age, in the Anthropocene – we no longer can write economic, political or cultural histories without also writing environmental histories. This milestone publication, together with similarly impactful analyses of how, for instance, past natural disasters have shaped human cultures in more recent periods (e.g. Janku et al. 2012; Schenk 2007), have led key figures in historical and contemporary archaeology to once more promote the environment – with all its entanglements with gender, indigeneity and power – as an important factor for studies of the recent past (Mrozowski 2010, 2014, 2018; Edgeworth 2014).

These developments, slow as they may be, are very encouraging. But where do they leave the deep past? If articulated more fully with the environmental humanities, these developments could usefully extend that perspective beyond the written record. Such an extension is important, I argue, because it would allow us to embrace a much greater evidence-base of environmental and societal constellations, and to transcend the problematic focus on only literate societies that is inherent in the reliance on written records. Hence, a 'palaeo' extension to the environmental humanities can play a vital empirical as well as conceptual role in the ongoing 'decolonization of thought' (Viveiros de Castro 2011:128).

Yet, if the Anthropocene is accepted as an official geological epoch, it is increasingly likely to be set to begin around 1950 (Zalasiewicz et al. 2017). There are many dissenting voices, however, and the *de jure* status of the Anthropocene as a bona fide geological epoch contested as even the cursory perusal of merely a fraction of recent writings on the Anthropocene will readily reveal (Ruddiman 2018; Brown et al. 2013; Schmidt & Frank 2018; Finney & Edwards 2016; Braje 2016; Malhi 2017). Its *de facto* status as a research focus is not in doubt, however. Here, I wish to make two observations regarding its proposed late onset: first, with the nuclear fallout of the many atomic bomb detonations of the 1950s chosen as the critical global marker of the Anthropocene, this point of onset coincides with our traditional 'archaeological present' *vis-à-vis* radiocarbon dating. In a playful way at least, this then makes the shallow Anthropocene a kind of future imaginary, where the archaeological record of the very recent past provides a material stage for reflections about those futures yet to unfold (cf. Vestergaard & Riede 2016, 2017). Second, this division carries with it the risk of relegating the pre-1950s past to some politically largely irrelevant 'pre-Anthropocene'. The coincidence of the 1950 starting date with the notion of modernity would all too easily lead to a focus on precisely the same self-reflexive and ultimately unproductive preoccupations that define the latter – to the detriment of thinking climate and environments causally into our research designs, interpretations and solutions (Bauer & Ellis 2018; Fox et al. 2017).

It is here my argument truly comes into play. In defining archaeology as a palaeoenvironmental humanities discipline, I am highlighting the shared temporal window between shallow-time disciplines and their deep-time counterparts (figure 1). It is in this shared window that opportunities for interdisciplinary collaboration and conversation arise. A second component of the palaeoenvironmental humanities perspective is the important realization that the deep past, too, weighs significantly on the present. In quite practical terms, we can only hope to truly understand climatic and ecological baselines if we look towards the past (e.g. Swetnam et al. 1999; Szabó

2010); sometimes the archaeological record even allows us to reconstruct important and useful ecological knowledge (e.g. Barthel et al. 2013a, 2013b; Guttmann-Bond 2010; Cooper & Sheets 2012), although such instances are rare and should probably not be overrated (Lane 2015) – solutions from the past do not come easily. More powerfully perhaps than concrete solutions offered by ancient technologies, people draw on archaeology to construct local, regional, national and other kinds of identities and social capital – and the deep past is as much entangled in the politics of geo-cultural heritage as the recent past. In fact, I argue that, as we enter the so-called Anthropocene – the Human Age – the archaeological record of the Pleistocene becomes all the more relevant: the climate of the Pleistocene has been described by the late William Burroughs (2005) as the 'reign of chaos'. The Holocene can be seen as the period where people increasingly aspired to bring order to this chaos, to master 'Nature', to build mighty civilisations and in this process to reshape ecologies at various scales to fit their needs. In the Anthropocene, these aspirations have taken on runaway characteristics and, once more, control over 'Nature' is slipping from our hands. The causes may differ, but the consequences converge – we lose control.

The environmental historian Dagomar Degroot recently wrote in *The Washington Post*:

> Ultimately, the lessons of the past come to us in the form of parables, stories that hint at deeper truths but do not tell us exactly what to do. That does not make them any less valuable. We now know that we cannot ignore our changing climate, that it will shape our fortunes in the decades to come. (Degroot 2018)

Parables are fine and it is certainly possible to see the many proposed instances of past societal change or collapse related to the environment not as powerful, evidence-based completed experiments of history (e.g. Diamond

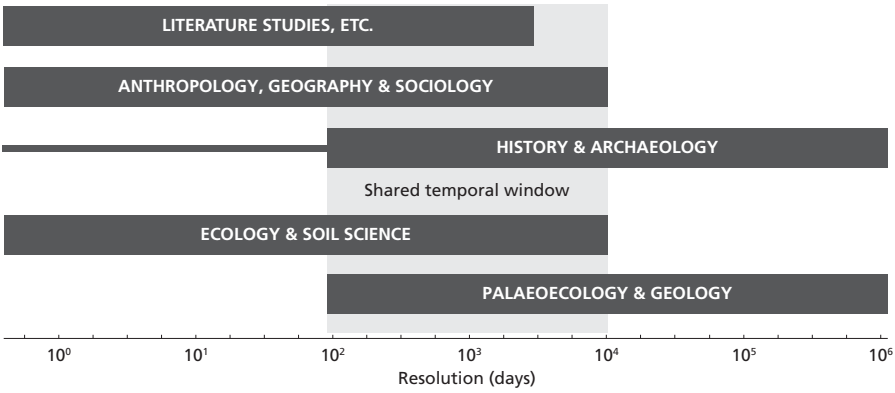


Figure 1. The overlapping temporal windows of disciplinary perspectives within the established (neo-) and the deep time (palaeo-)environmental humanities. Modified from Rull (2014).

& Robinson 2010) but merely as a convenient rhetorical sleight of hand, as a clever way of telling and selling our products (Middleton 2017). I find such a stance troubling. There is broad scientific and, in Europe at least, public consensus that climate change is happening in our time and that societies are being affected by it. How can we maintain such a conviction if we not also consider past peoples being significantly affected by climate, environment and their changes? Hence, I consider it critical that the stories archaeology tells are not merely just-so stories, not just parables, but that we make them as correct as we can using relevant and replicable scientific methods. Uncertainty in interpretation should not be feared but accounted for as an inherent feature of any scientific endeavour (Oreskes 2015). By the same token, uncertainties must not be confused with a fundamental inability to retrieve valid knowledge about the past (Shennan 2004).

Archaeology is, as the philosopher of science Adrian Currie (2018) has encouragingly pointed out, methodologically omnivorous. Owing to this omnivory, archaeology can draw productively on its diverse portfolio: there is no need to align environmental archaeology exclusively with the 'softer' approaches of the environmental humanities, nor does archaeology need to see itself as providing merely human-interest narratives to the climate science reconstructions of past environments. In particular, recent pushes for greater reproducibility and data-sharing in archaeology (Marwick et al. 2017; Marwick 2017; Marwick & Birch 2018), coupled with an increased awareness of the inevitable ethical entanglement of any environmental archaeological study with contemporary concerns (Riede et al. 2016a), may allow us to move beyond strawmen such as environmental determinism or other tendencies and terminologies that often internally polarize and externally paralyze the humanities. In this context, archaeology needs to be aware of its own position: the linkage of European and with it also Scandinavian archaeology with the emergence of the modern nation state and the ideologies of capitalism and consumption (Kristiansen 1993) must be taken account of. Although environmental archaeological approaches have played an important role in the development of Scandinavian archaeology per se (Kristiansen 2002; Gron & Rowley-Conwy 2018), this is rarely linked to its nation-state mandate and the contemporary heritage management and representation issues that arise from it (Prescott 2016; Högberg 2016; Brück & Stutz 2016). Studies that challenge cherished parts of the Scandinavian past where prehistoric cultures that strongly overlap with contemporary or recent historical borders conveniently reinforce essentialist notions of deep ancestry (e.g. Nielsen & Riede 2018; Riede 2017) can be difficult to conduct. It can be argued – perhaps somewhat harshly – that different subtle biases, educational structures strongly linked to a primarily national job market and data management practices strongly linked to national databases serve to reify

and reinforce this '*Heimatkunde* writ large' perspective (cf. Sauer & Riede 2018; Riede 2017). All too easily then, canonical archaeological cases – from elusive Neanderthals to obstinate Ertebøllians and the seemingly omnipresent Viking entrepreneurs (e.g. Dobat 2013, 2017) – become entrained in a methodologically nationalistic (Chernilo 2006, 2011) discourse where ever-increasing consumption, domestication and colonization, budding nations and growing capitalism unwittingly correlate. Worryingly, this is strongly reminiscent of the dark narrative of the 'Capitalocene' (Haraway 2015; Moore 2017) dressed in the somehow more innocent and glorious narrative of modern nation-building (cf. Høgh 2008; Malm & Hornborg 2014). And while research may move on, media narratives, children's books, school materials and textbooks are slow to change, halting rather than facilitating the 'unprecedented transitions' now so urgently called for.

## Strategies of engagement in an ecosystem of knowledge and action

I am a reluctant rainbow warrior at best, but like it or not, archaeology – from the Stone Age to the Human Age – is deeply entangled with contemporary concerns regarding the environment. It is clear to me that political sentiments cannot be side-lined in our choices of archaeological research topics. Yet, my motivation to focus ever more strongly on a palaeoenvironmental perspective on the archaeological record is, in the first instance, the result of a career of investigating human-environment relations. It is the archaeological record itself that offers the strongest of narratives about human-environment relation. This entanglement also means that the past – deep and shallow – weighs in on the present. Through the papers we write, the courses we teach, and the exhibitions we stage, the past affects the present, affects the future, makes a difference (Jackson et al. 2018). As public debate on climate change, resource use and environmental policies moves from 'matters of fact' to 'matters of concern' (Stewart & Lewis 2017), archaeology stands to gain a new relevance. Many of the thoughts outlined here have been foreshadowed by Brit Solli's (2011) precocious paper, but re-casting archaeology as a 'palaeo' variant of the environmental humanities leads us to engage even more fully with a wider inter- and transdisciplinary landscape; it confronts us with the ethics of research and research communication and the work our research does in the contemporary world; it also leads to think harder about the role of archaeology and heritage in the Anthropocene futures (Holtorf & Högberg 2015).

Archaeology is a peculiar type of humanities subject in at least two regards: it is earth-bound in an empirical sense and it commands remarkable

museum attention. I would insist that we, in this moment where quantified scenarios of climate change garner most scientific, public and policy traction (cf. Heymann et al. 2017), do not forsake but embrace data-driven archaeological approaches to past human-environment relations. Archaeology everywhere tells salient climate stories (Rockman 2015) – if we chose to tell them. Elsewhere, colleagues and I have called for a systematic and strategic engagement of archaeology and archaeologists with contemporary climate change (Jackson et al. 2017, 2018). We can do so by placing our publications in those journals that feed information up to policy-influencing documents such as the IPCC; we can engage in community archaeological projects revolving around vanishing heritage; we can seek out contact with planners and policy-makers; and we can also attempt to strategically engage museum professionals in this endeavour.

We also try to walk the walk and to in fact draw on the strong local, regional and national embeddedness of archaeology that I critiqued above. In the context of a large EU-funded climate change adaptation project led by the Region of Central Denmark (Coast to Coast Climate Challenge), I lead a sub-project that uses local climate narratives anchored in historical and archaeological sites to facilitate citizen engagement with the issues at hand. It also brings conjoined cultural and environmental histories into spaces and discourses that are otherwise dominated by planners, managers and engineers through exhibition work. In a different project, we have tackled the environmental dimensions of fossil fuel extraction and developing capitalism in western Denmark through excavations and with the explicit aim of creating an exhibition (Riede et al. 2016b; Vestergaard & Riede 2016). This project focused on the former lignite mining site of Søby in central-western Denmark, where an associated museum portrays a traditional narrative of entrepreneurial and largely male ingenuity and of economic success. Our exhibition took on the darker environmental dimensions of these important aspects of modernity (see Blæsild & Beck 2016; Brichet et al. 2017).

While much ink being spilled about the Anthropocene may be more smoke than fire, these diverse writings have usefully highlighted that the debate on human-environment interactions, the impacts of climate change on human societies and vice versa, is not an issue of natural science alone, but one that is rightfully at home across disciplines; if humans and their actions are now a geological force shaping global environmental future, then the Anthropocene falls as much under the remit of the humanities as the natural sciences (Swanson 2016; Bauer & Ellis 2018). Attempts to bring archaeology under the wing of the environmental humanities have been and are – excitingly! – underway in Scandinavia, albeit with varying success in terms of creating lasting institutional structures (e.g. Sørensen & Eskjær

2014; Holm et al. 2004; Nye et al. 2013). The conjoining of cultural and natural histories and of cultural and natural actions points into the deep past where we can hope to identify causal processes and pathways, and where we can retrieve materials for new narratives about human-environment interactions. It also points to the future in the sense that attempts to tackle current and future environmentally related challenges must be thought of as a multi-sectorial and multi-stakeholder concern that is intimately linked with issues of inter-generational social justice, education and ethics. If we accept this conjoining, then museums of culture history become relevant. In Denmark at least – and seemingly in most other parts of Europe (see Egmus) – strikingly more people visit museums of cultural history than museums of natural history (figure 2). Hence, it is museums of cultural history that are in principle much better poised to serve as 'safe places for unsafe ideas' (Gurian 2006:99), as 'provocateurs' (Cameron 2019:647) or even as 'catalysts for change' (Rees 2017:166) in relation to contemporary environmental concerns (see also Cameron & Neilson 2015; Cameron et al. 2013; Cameron & Deslandes 2011).

Cultural heritage is not only a victim of climate change (e.g. Hollesen et al. 2015, 2017, 2018; Frederiksen 2018); in complex and manifold ways, it also generates actionable insights and social capital (Brewer & Riede 2018;

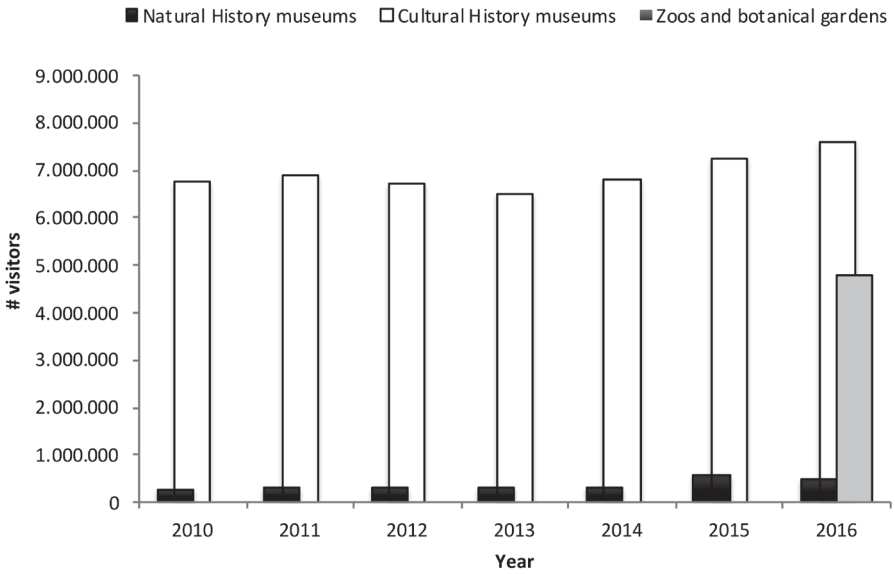


Figure 2. Visitor numbers in museums of cultural and natural history as well as botanical gardens in Denmark, as recorded by Statistics Denmark. Climate appears also to be of major political concern to Danish citizens (see Minter 2018) but note that this claim has also been contested. To my knowledge, it is not as yet, however, a major topic in exhibitions across the country.

Holtorf 2018; Hambrecht & Rockman 2017; Rockman 2012; Harvey & Perry 2015; Armstrong et al. 2017). As Mike Hulme (2008:5) noted:

> We are living in a climate of fear about our future climate. The language of the public discourse around global warming routinely uses a repertoire which includes words such as 'catastrophe', 'terror', 'danger', 'extinction' and 'collapse'. To help make sense of this phenomenon the story of the complex relationships between climates and cultures in different times and in different places is in urgent need of telling. If we can understand from the past something of this complex interweaving of our ideas of climate with their physical and cultural settings we may be better placed to prepare for different configurations of this relationship in the future.

Archaeology excels at telling such stories and its position in the public eye provides us with an opportunity for making them heard. Wright (2017) has recently argued for viewing the university as an ecosystem. I suggest that this notion can be usefully extended to archaeology as a discipline. Living and working together in such an ecosystem of knowledge and action requires above all mutual respect and the willingness to create knowledge together across theoretical, methodological and disciplinary divides. While we all have our predilections – mine are primarily but certainly not exclusively with an evolutionary and digitally enabled archaeology of deep time – each part of archaeology can be seen to fulfil a specific function; each part of archaeology reaches out to some constituency; each part of archaeology tells its 'story of the complex relationships between climates and cultures in different times and in different places'; each part of archaeology can be part and parcel of the impactful role the discipline – as a 'palaeo' variant of the environmental humanities – can play in the doubtlessly challenging societal transitions lying ahead.

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# Archaeology for the Humanities?

Poul Holm

Felix Riede makes a broad claim in the title – that knowing about deep pasts will help knowing about deep futures. In fact, he does not talk very much about futures but, if I am right, the logic is that a millennial perspective on human existence will help us think beyond what he calls the 'shallow Anthropocene' (i.e. the recent past and perhaps the immediately foreseeable future). In one sense, this is certainly right. Understanding the history of a phenomenon throws a perspective on the present. In this line of reasoning, Riede follows the same logic as the *History Manifesto* by Jo Guldi and David Armitage who argue that '[i]n the context of a deep past, conversations about a deep future may once again become possible' (Guldi & Armitage 2014:35). Understanding time – through the lens of historical sciences such as geology, archaeology and history – provides us with a sobering perspective on the precarious nature of that which may seem stable and durable.

There are, however, limitations to the logic. The human future is fundamentally unknowable because there is no way of predicting human innovation, action and reaction, not to speak of the problems of modelling hypercomplex systems. Predictions are therefore fraught with problems and the best we can do is to establish scenarios. Scenarios are limited by the power of our imagination. The past can fuel our imagination but will not repeat itself. History may tell us when and how we got locked into a certain path, and scenarios may help identify how to unlock our path dependency. In a

Department of History, Trinity College Dublin
Email: holmp@tcd.ie
Gothenburg University, Department of Historical Studies

practical sense, the historical sciences help identify what we have lost and changed (biotopes, species diversity, landscapes), and accordingly inform managers of what may be regenerated and what is forever lost. In these ways, historical insight is crucial for short- to medium-term decision models on relatively stable parameters. History may not, however, help us much when we imagine 'deep futures' of a complex and innovating system. Philosopher Karl Popper famously warned against the *Poverty of Historicism* in a polemic against future predictions by Plato, Marx and others. Let's take heed. Archaeology is as unable as any other discipline to predict the human future in a hundred years' time. From deep pasts to deep futures is a great phrase but it may cloud our vision.

Apart from this quibble about the title, I agree that archaeology has an important role to play for our immediate future. Riede argues convincingly that archaeology needs to develop a pro-environmental dialogue through museums and public media and to be aware of the discipline's often problematic role as a builder of identity. Riede is right that archaeologists need to raise the alarm that archives in the ground are rapidly being lost because of environmental and climate change. In order to play that public role, it is important that archaeologists team up with other interested parties, including colleagues in the humanities.

Public service is an important reason to establish nodes such as centres for environmental humanities. Academics are notoriously poor at speaking up in unison on matters of joint concern, and we are even worse at organising ourselves to fit the purpose. Centres for environmental humanities may help us join up across disciplinary boundaries and address a wider agenda. As an example of how this may be done, I point to the global Humanities *for* the Environment observatories (Humanities for the Environment 2019), which include a wide range of disciplines from literary scholars to archaeologists. One important lesson from this experience is that our colleagues in the natural sciences tend to applaud us coming together as a humanities club. Far too often natural scientists only know one or two colleagues in the humanities by sheer coincidence. Identifiable centres of environmental humanities ease collaboration across faculty divides as colleagues may rely on centres to help them identify relevant partners.

Riede confesses to being a reluctant rainbow warrior at best but thinks that archaeology stands to gain a renewed and redefined relevance by casting itself as palaeo-environmental humanities. Riede's argument is strong and raises the question of whether science – including the humanities – can and should have a political agenda. In this concern, the humanities – including archaeology – have so far lived a more sheltered life than the earth and climate sciences. But clearly, ethical and advocacy questions are becoming increasingly important to how we behave as scholars. There is much to be

learnt and humanities centres may help improve practices of translational humanities – i.e. engaging with and learning from public engagement.

Apart from an advocacy role for archaeology, Riede argues that there is also an academic benefit to thinking of archaeology as a 'palaeo' variant of the environmental humanities. This part of the argument is less clear to me. Riede believes that other disciplines may benefit from the fact that archaeology brings a long-term perspective which is lacking in what he calls 'shallow-time disciplines' such as literature studies and anthropology. This needs qualification beyond Riede's mention of a shared time-window. Major humanities disciplines such as history, classics, art history, philosophy, religious studies, and linguistics operate with a window on the past of the last four or five thousand years in China as well as the Near East, and two thousand years in many other regions. In this, they share a time horizon with the majority of archaeologists. Of course, Neolithic archaeology reaches into times that are closed to most other humanities disciplines, and the Pleistocene world is a powerful contrast to the depleted natural habitats of today. But time-depth is not the unique selling point of archaeology.

Rather, I would argue that archaeology is a contingent assembly of methodologies to wrestle evidence of the past out of material evidence. As a historian myself, I read archaeological papers because they provide unique insights based on inquiry and methods that are beyond my reach. I am interested in archaeology primarily for what it tells me about a problem that concerns me – be it by contemporary or comparative evidence. To me, what makes archaeology a strong component of the historical disciplines is its methodological rigour and technical expertise rather than its long-term perspective.

This observation brings me to ask Riede what archaeologists may learn from working with other humanities disciplines? The paper has much on what archaeologists have to offer, not so much on what they may take away. What is the advantage to archaeology of increasing collaboration with other humanities disciplines? Archaeology is, of course, blessed with lots of collaborative experience with many disciplines, especially in the natural sciences, but less so with humanities disciplines. I have come across archaeologists who have deliberately refrained from learning from historical studies not to mention other humanities approaches – and indeed I have met historians who remain deeply sceptical of archaeology. I would like to know what Riede believes archaeology may learn from the humanities. In particular, I would like him to speak to the large community of environmental historians – perhaps the group of environmental humanities closest to archaeology and yet our paths seldom cross.

Riede claims that environmental humanities have generally risen out of postmodern theoretical approaches which are largely alien to archaeology

– and leaves it there. I would have welcomed a more head-on discussion. I think Riede gets the historiography wrong because he ignores the one half of environmental humanities centres which are actually born out of environmental history initiatives which were never postmodernist. There is definitely a strand of postmodernism still alive in the humanities though it is much reduced since the heyday of twenty or thirty years ago. I would go so far as to say that the rise of ecocritical approaches in literature may take some of the credit for this demise – it is hard to play word games with disasters – but there is still a way to go, and archaeologists have a vital role to play. This role, as I see it, is not so much to harp on long-term perspectives but to sharpen debates in the humanities about our methodological and analytical skills.

To conclude, I share Riede's ambition to develop the environmental humanities as a platform for curiosity-driven research into how humans have shaped and are transforming our planet. The human and natural past should be the basis for a fruitful dialogue across the humanities and natural sciences, and when it happens it is wonderful. Unfortunately, it happens too infrequently to be the norm. Surely, multidisciplinary collaboration must be the rallying call for the environmental humanities, and archaeology to me is a born member of that club.

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# ‘For Purposes Altogether Unscientific’

Paul J. Lane

As citizens and human beings, archaeologists understandably desire that their work and expertise should have value as a public good adding to, rather than detracting from, individual and collective qualities of life, social justice and well-being (Sabloff 2008; González-Ruibal 2013; Little & Shackel 2014). Different generations of archaeologists have articulated such desires generally in keeping with the challenges of their times and their specific socio-cultural perspectives. Given the accumulating body of information on the potential consequences of rapidly escalating climate change for our planet, it is unsurprising that in recent decades perennial concerns over the societal relevance of archaeological knowledge have increasingly intersected with broader anxieties over what the future may presage for our species (Ellis & Trachtenberg 2013; Hamilton et al. 2015; Dean 2017; Mitman et al. 2018) and our non-human planetary co-inhabitants (Human Animal Research Network Editorial Collective 2015; McGill et al. 2015).

In this keynote paper, Felix Riede engages with several of these issues to map out his own vision of archaeology’s future role. A central thread of his argument concerns the value and importance of extending the temporal range of the environmental humanities through closer engagement with archaeological and palaeoecological data and perspectives. In making this argument, Riede emphasises the importance of humanizing current scholarly discourse around climate change as a means to stimulate public en-

Department of Archaeology, University of Cambridge
Email: pjl29@cam.ac.uk
Department of Archaeology and Ancient History, Uppsala University
School of Geography, Archaeology and Environmental Studies, Witwatersrand University

gagement with the urgency and scale of social, behavioural, political and other changes necessary to ensure critical Earth system thresholds, the so-called planetary boundaries (Rockström et al. 2009), are not crossed. He also expresses concern that, somewhat surprisingly, deep-time archaeological perspectives have had only a marginal role in debates over how best to achieve this. Leaving aside whether Riede somewhat understates matters in terms of the efforts made by archaeologists to demonstrate the contemporary relevance of their work to addressing issues of future resilience and sustainability (see, e.g., Van der Leeuw & Redman 2002; Skoglund & Svensson 2010; Kintigh et al. 2014; Scharf 2014; Shaw 2016; Fitzpatrick & Erlandson 2018; Rivera-Collazo et al. 2018), he certainly has a point. Deep-time perspectives, whether generated by archaeologists or palaeoecologists, still have limited resonance for international bodies such as the Intergovernmental Panel on Climate Change. As critically, 'palaeo-' perspectives are also largely absent from recent calls for future action and manifestos for historicizing the Anthropocene made by many promoters of environmental humanities, especially Scandinavian perspectives (e.g. Ekström & Sörlin 2012; Palsson et al. 2013; Holm et al. 2013; Norgaard 2018; Sörlin & Lane 2018), with some notable exceptions, however (e.g., Fredengren 2016; Hartman et al. 2017). Equally, proponents of Education for Sustainable Development, another emerging disciplinary field that has been greatly inspired by Scandinavian researchers and sensibilities, seem to have largely ignored the potential value of tangible and intangible heritage as cultural anchors in a rapidly transforming and challenged world (Breidlid 2009; Huckle & Wals 2015).

Riede identifies three lines of connection between archaeology and other fields that illustrate the unique contributions archaeology can make to contemporary debates around climate change. The first of these, most obviously, through such subfields as geoarchaeology and environmental archaeology, is with the climate and environmental sciences, as others have also emphasized (e.g. Brooks et al. 2009; d'Alpoim Guedes et al. 2016; Marchant & Lane 2014). The second line of connection derives from archaeology's 'embeddedness in cultural heritage, identity-formation processes and the museum interface' (Goodnow & Akman 2008; Hare 2015). Riede's third connecting line derives from the discipline's tradition of engaging with its publics, local communities, and primary and secondary school students (Svensson 2009; Torres & Márquez-Grant 2011; Ekeland 2017). Emphasising archaeology's distinctiveness as an empirically earth-bound humanity that 'commands remarkable museum attention', Riede illustrates some of the strategies he and his collaborators have used in recent and ongoing work, and especially the importance of recasting museum exhibitions in a manner that positions them at the centre of public debates over our planet's future.

A more implicit facet of his argument is the need for a different (I hesitate to write 'new') style of communicating scientific knowledge about past, present and possible future human-environment entanglements, Homo sapiens' complicity in driving climate change, biodiversity loss, land and natural resources degradation and all the attendant social and humanitarian challenges these have given rise to. A need, in other words, to overcome the common epistemic distancing that occurs when we are confronted by charts, tables and figures documenting the empirical evidence for current rapid climate change and its likely drivers. As Lesley Duxbury (2010:294) has noted, far from galvanising us to action and behavioural changes, even as the quantity of empirical data released into the public domain has increased, climate change remains difficult for the non-specialist 'to comprehend or connect with in an appreciable way'. In calling for more effective communication to lay audiences by drawing on archaeology's unique ability to transcend boundaries between deep-time and shallow-time disciplines, Riede echoes some of the thinking of the British novelist, poet and archaeologist Jacquetta Hawkes. As she expressed in her most widely-read and critically acclaimed book, *A Land*, 'geologists and archaeologists [...] [are] instruments of consciousness [...] engaged in reawakening the memory of the world' (Hawkes 2001[1951]:26).

Like many of her generation of British archaeologists, among them Gordon Childe, Graham Clarke and Mortimer Wheeler (Moshenska & Schadla-Hall 2011), Hawkes was committed to communicating archaeological results to a wider public. She was also a pioneer in the use of films as a means to achieve this (Hawkes 1946; see also Finn 2000). Writing in early post-war Britain, and having witnessed the ravages of World War II and the transformations in farming practices this necessitated, as well as the loss of the countryside as a consequence of post-war urban development and reconstruction, Hawkes' picture of Britain is certainly overly nostalgic. Her assessment of the impacts of the Industrial Revolution focus on the loss of ties to the land, the erosion of the (English) countryside in the face of urban sprawl and, in the early twentieth century, also the motor car, and not on, for example, either the early negative consequences for public health, the rise of capitalism, or other longer-term legacies. Implicitly, she also expresses concern over the decline of an older pattern of class relations in a manner that does not align with modern sensibilities. However, as the landscape historian Richard Muir (2003) has highlighted, Jacquetta Hawkes was also an ardent campaigner for nuclear disarmament, an early supporter of environmentalism and greatly troubled by an increasing scientism in the discipline (see e.g. Hawkes 1969) – a concern that has found recent re-expression in the pages of the *Norwegian Archaeological Review* (Sørensen 2017 and commentary). Importantly, it is the style of Hawkes' writing that makes *A Land* so prescient. Uniquely among her generation of

British archaeologists, she chose deliberately to use of the findings of palaeosciences such as archaeology and geology for 'purposes altogether unscientific' (Hawkes 2001 [1951]:xix), to convey their importance to understanding individual and collective 'being-in-the-world' to wider audiences (and without a whiff of Heidegger, either!).

For Muir (2003:102), Hawkes perfectly captures the essence of our 'organic world flowing with visceral, submerged forces in which everything connects with everything else and where conventionally inanimate objects like trees, vegetables, rocks and buildings have senses and vibrancy and can surge and bend'. The cultural geographer Hayden Lorimer (2012), is equally complimentary, describing *A Land* as 'experimental in composition, serious and cerebral in tone, yet at the same time imaginatively and intimately conversational', full of 'dreamscapes, wellsprings of desire and dramatic riffs'. One of Hawkes' particular qualities was her ability to draw connections between seemingly disparate entities, while never losing sight of archaeology's potential to help us 'understand what it is to be human' (Finn 2001:43). As Hawkes herself observed, '[o]ur subject has social responsibilities and opportunities which it can fulfil through school education, through museums and books and through all the instruments of what is often rather disagreeably called 'mass communications' – the press, broadcasting, films and now television. If archaeology is to make its contribution to contemporary life and not risk sooner or later being jettisoned by society, all its followers, even the narrowest specialists, should not be too proud to take part in its diffusion' (Hawkes 1952:198).

If there are echoes of Jacquetta Hawkes' work, whether intentional or not, in Riede's piece there are also absences and, perhaps missed opportunities. We can all agree with his suggestion that getting the insights of archaeological deep-time perspectives across to those who are most influential in shaping policy responses to climate change, requires targeting a different range of academic publication outlets than has been conventional. In our increasingly social media-driven societies, we should also (including dinosaurs like myself) be making more effective use of digital technologies to communicate our results and insights with lay audiences in a more critically informed way, cognisant of the overlapping issues of power, freedom, control and exploitation embedded in the way social webs are used and constructed (Perry & Beale 2015).

But, we need more than this. We need communicators who can weave tales that link the material traces of long-gone societies to our own routine practices, explain the multi-sited and multi-temporal nature of our individual and collective identities, and illustrate their multi-species contingencies. These should not just provide cautionary tales, or harrowing accounts of why we face the environmental challenges we do on account of our past

practices and neglect, important though these might be (Bulfin 2017). We also need future scenarios of the possible, drawn from past illustrations of how 'human energy and intelligence can be applied to that which is already part of the fabric of life to meet human needs' without either causing further harm to the planet or trying to reinvent the past (Albrecht 2018:364). I have yet to be convinced that archaeologists, with their inherent 'backward looking curiosity', are the best persons to generate these visions. We need to have the honesty to admit this and find suitable partners not just from the arts, humanities, but also other constituencies, including but not limited to climate activism, environmental psychology, multi-sensory ecology, future studies, and sustainability education, to collaborate with, and who can deliver on these messages if we truly desire our work to resonate with policy makers, government agencies and our publics.

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# The Anthropocene: Not Only About Climate Change

Brit Solli

Fifty years ago hippies dreamt about a new time, that 'the times they are a-changin'' (Dylan 1964), that a new world of peace and love should emerge; the coming of the Age of Aquarius. However, things did not go so well. According to influential earth scientists now, even the hippies of 1968 were living in the epoch of the Anthropocene.

## Background: A short review

In 2000 the Nobel laureate chemist Paul J. Crutzen and his collaborator, marine science specialist Eugene F. Stoermer, suggested in a short statement that planet earth has entered a new geological 'era' namely the *Anthropocene* (Crutzen & Stoermer 2000). In 2002 Crutzen developed his argument further under the headline 'Geology of mankind' in the journal *Nature*. He stated that:

> The Anthropocene could be said to have started in the late eighteenth century when analyses of air trapped in the polar ice showed the beginning of growing global concentration of carbon dioxide and methane. [...] It seems appropriate to assign the term 'Anthropocene' to the present, in many ways human-dominated, geological epoch, supplementing the Holocene – the warm period of the past 10–12 millennia. (Crutzen 2002:23)

Museum of Cultural History, Department of Archaeology, University of Oslo
Email: brit.solli@khm.uio.no

In February 2008 a group of 21 researchers, members of the Stratigraphy Commission of the Geological Society of London, concluded that we are now living in the Anthropocene epoch (i.e. the Holocene has been replaced) and they even claimed that this was a 'conservative' conclusion (Zalasiewicz et al. 2008). At first Crutzen & Stoermer (2000) and Zalasiewicz et al. (2008) estimated the beginning of this new epoch, the Anthropocene, to *c.*AD 1800, and associated it with the industrial revolution.

These discussions have continued since 2008, with the members of the Anthropocene Working Group (AWG), which is a subgroup of the International Subcommission on Quaternary Stratigraphy (ISQS, a constituent body of the International Commission on Stratigraphy (ICS), and part of the International Union of Geological Sciences), looking for a 'Golden Global Geological Spike'.

The term 'Golden Spike' is used when a 'global boundary stratotype section and point" (GSSP) has been officially agreed by the ICS (cf. above) e.g. the chronostratigraphic boundary between the Pleistocene and Holocene. Since 2010 discussions have revolved around the *Great Acceleration*: '[t]he post-1950 acceleration in the Earth System indicators remains clear' (Steffen et al. 2015: 81), with the Golden Spike associated with the development of nuclear power and atomic bomb testing from 1946, or so-called 'artificial radionuclides' resulting from atomic detonations (Zalasieswicz et al. 2010:2230).

In a recently published article Waters et al. (2018) maintain: '[a]lthough atmospheric tests and military use began in 1945 CE, it was only with the testing of the large thermonuclear (hydrogen) devices from 1952 CE that fallout was dispersed globally and became recorded in most environments' (Waters et al. 2018:383). Furthermore, '[t]he rate of increase between 1950 and 2015 CE is 100 times greater than the Late Pleistocene to Early Holocene rise, itself considered rapid in geological terms (Wolff 2014)' (Waters et al. 2018:382).

Felix Riede stresses in his thought-provoking article how archaeologists should involve themselves in the discussions presented above: we should take part in cross- disciplinary climate related research and environmental humanities projects. I concur entirely with Riede on this point.

## Earth scientists and geologists keep on discussing …

The term Anthropocene has only been introduced informally; it has not yet been officially ratified by the world's major scientific organizations. Geologists and earth scientists discuss whether there is a *need* for a new concept covering the last 250 or 65–70 years of immense human impact on

the Earth (cf. Crossland et al. 2005; Ehlers & Kraftt 2006). Critics of formalizing the Anthropocene have maintained that it 'is a misleading term of non-stratigraphic origin and usage'; it focuses 'on observation of human history or speculation about the future'; it is 'driven more by politics than science' (Zalasiewicz et al. 2017:206).

In an article published in 2017 Jan Zalasiewicz and 26 scientists respond to these criticisms. They concede that the 'Anthropocene differs from previously defined epochs in reflecting contemporary geological change, which in turn also leads to the term's use over a wide range of social and political discourse' (Zalasiewicz et al. 2017:206). However, for the geologists it is the geological evidence that is decisive for the end of the Holocene and the beginning of the Anthropocene (Zalasiewicz et al. 2017:206).

A cross-disciplinary group of 24 scientists recently presented geological evidence for the 'Anthropocene as a potential new unit of the international Chronostratigraphic Chart (which serves as the basis of the Geological Time Scale)' (Waters et al. 2018). They also maintain that anthropogenic deposits and the 'archaeosphere' may play a vital role in defining the Anthropocene (Waters et al. 2018:385–395).

## Memento: The Anthropocene is not only about climate change

Hence, it is important to underline that the Anthropocene is *not* only about climate change and global warming (cf. Pétursdóttir 2017). It concerns 'anthropogenic deposits', which include sedimentary 'successions that have accumulated through direct human deposition (artificial ground) or by human influence on natural systems' (Waters et al. 2018:385). The lower boundary of anthropogenic modified deposits have been termed 'archaeosphere' by among others Matt Edgeworth (2017), a member of the AWG.

Matt Edgeworth et al. (2019) stress the role of the archaeosphere even further, arguing that finding the start of the Anthropocene through geological chronostratigraphic methods (finding the Golden Spike) is unsuitable 'for determining the start of the proposed new time unit'. The Anthropocene is defined by human activity, and thereby on archaeological and historical timescales, not on the geological timescales of millions of years. Edgeworth et al. maintain that we should study the definition of the Anthropocene from the 'ground-up', with special attention to anthropogenic strata formations and humanly modified ground: the archaeosphere. Edgeworth et al. criticize the above proposed start of the Anthropocene 'because of its extreme proximity in time' and on the grounds that it is 'essentially non-stratigraphic'.

It has been estimated that the spatial extent of human landscape is 'about 16% of the total Earth's surface or 55% of the terrestrial land surface' (Waters et al 2018:385): We are talking about terraforming, including landfills, mega-cities, dam-building and river-diversions, all kinds of earth engineering, marine deposits in oceans, lakes and rivers, de-forestation and erosion: how humans alter the surface of the oceans, seas and lakes, the earth, and atmosphere.

Furthermore, the extinction of animals must also be taken into account – the so-called sixth extinction – along with the consequences of global population increase (from *c.*750 million in 1750 people to 7.6 billion today, and a possible 9.7 billion in 2050 (United Nations 2015). In many ways this dramatic population increase, especially in Africa south of the Sahara, may be considered as an 'elephant in the room' concerning the ongoing discussions about the Anthropocene.

In the Anthropocene the oceans are full of plastic; small fibres of plastic/micro plastic have been discovered even in remote areas of the Arctic and Antarctica. Styrofoam and plastic are everywhere; they are so-called 'hyper-objects' (Morton 2013), and can be taken into account through a thin but 'recognizable and unique set of stratigraphic signals' (Zalasiewicz et al. 2017:213).

I am in complete agreement with Riede stating that 'climate change on human societies and vice versa, is not an issue of natural science alone' (Riede this volume:20). However, we must not forget that the Anthropocene is about more than climate change.

## Has the Anthropocene become an empty buzzword?

In 2011 I wrote an article in the *Norwegian Archaeological Review* called 'Some reflections on heritage and archaeology in the Anthropocene' (Solli 2011:40–54). The paper was followed by critique and discussion. Some of the discussants maintained that the viewpoints I presented were a bit gloomy – well better to be a realist, than a naïve optimist.

In 2011 the Anthropocene was known in many academic circles but was not a concept widely spread in popular media. A quick google search finds that quite early academic and semi-academic examples are (from *c.*2010): the poetry of the Anthropocene; the music of the Anthropocene; museum exhibitions of the Anthropocene – for example in 2015 Deutsches Museum headlined an exhibition with the title *Welcome to the Anthropocene*. In September 2011 the Museum of Cultural History in Oslo (my own museum) presented an exhibition entitled *The Archaeology of Ice – Finds From*

*the Frozen Past* in which the Anthropocene was mentioned in association with prehistoric artefacts coming out of melting ice and snow patches in the Norwegian high mountains (see web version of the exhibition: Museum of Cultural History). Other topics discussing the Anthropocene have included: Feminism of the Anthropocene; Legal Theory and the Anthropocene Challenge; I could go on.

Is the term Anthropocene in 2019 becoming so widely used that it is in the process of losing its meaning? In the 1990s everything was supposed to be considered 'sustainable' in line with the UN commission's central concept of 'sustainable development' in the report *Our Common future* (Brundtland 1987) and the Rio summit in 1992. Is the Anthropocene, like 'sustainability', becoming an all-purpose concept, introduced everywhere without any real consideration of what it means that 'we are living in the Anthropocene'?

The term Anthropocene is increasingly becoming a concept that the geologists and earth scientists have lost control over; it is now a popular term closely connected to climate change and global warming, and for many people a feeling of crisis and of something inevitable. The Anthropocene has become, not only a scientific concept, but also an emotional and cultural concept.

In many ways the Anthropocene is used as a buzzword, but it is worth attention for all scientific disciplines. It may be used as a linguistic concept, but describes a situation that is too much of a reality 'out there' in the real world (Solli 2011:52). We are not dealing with, in the terms of the German writer Herman Hesse, a glass-bead game.

## Why should the humanities, archaeologists and historians bother about the Anthropocene?

In a seminal article the Indian historian Dipesh Chakrabarty (previously mostly known for his post-colonial studies) stated that all historical disciplines exist 'on the assumption that our past, present, and future are connected by a certain continuity of human experience' and that because of the rapidly changing climate 'the exercise of historical understanding [is] thrown into a deep contradiction and confusion' (Chakrabarty 2008:197–198).

According to Chakrabarty it is the *idea of the human* that sustains disciplines like history and archaeology. Chakrabarty presented four theses in his article, the second of which states that the: 'idea of the Anthropocene, the new geological epoch when humans exist as a geological force, severely qualifies humanist history of modernity/globalization'. Furthermore, 'in no

discussion of freedom in the period since the Enlightenment was there ever any awareness of the geological agency that human beings were acquiring at the same time as and through processes closely linked to their acquisition of freedom [...] Most of our freedoms so far have been energy – intensive' (Chakrabarty 2008:208).

Think about that! Most of our freedoms, in the richer countries of the world, are based on a high degree of energy consumption. As a woman growing up in the latter half of the twentieth century in Scandinavia, I have had an immense freedom to create my personal life, free education, good job opportunities, and freedom to travel. Major parts of the Scandinavian population have experienced economic growth during the last decades. Our freedoms have been based mostly on fossil energy sources. Although, especially in Sweden and Norway, a lot of the energy we use is based on waterfalls and the relatively 'clean' hydro-power (albeit the building of these dam-constructions transforms and terra-forms large areas of natural landscapes), Norway is an oil producing nation, and important parts of the economy depend on fossil energy. Income from oil has been a significant factor for economic growth from the 1970s, and especially since the mid-1990s, therefore indirectly influencing my own freedom of choice.

Chakrabarty maintains that 'the whole crisis cannot be reduced to a story of capitalism [...] Climate change is an unintended consequence of human actions and shows, only through scientific analysis, the effects of our actions as a species' (Chakrabarty 2008:221).

Chakrabarty's four theses have been met with interest, debates and criticism:

> The idea of the Anthropocene severely qualifies humanist histories of modernity and globalization, whether of the neoliberal, progressive, or Marxist variety. Its geological hypothesis requires us to put global histories of capital in conversation with the species history of humans, as colonial expansion and capitalist accumulation produced both historical inequalities and locked in future climate instability tied to humanity at the level of a *global* population. (Emmett & Lekan 2016:8)

Critics have accused Chakrabarty of letting the western capitalist industrialized world too easily off the 'hook' of the crisis (González-Ruibal 2018:5–6). Some parts of the world are much more to blame for the Anthropocene than other parts. The western world, both as previous colonizers, and as overly rich consumer societies, must take more responsibility for the crisis of the Anthropocene, than poorer nations. This sounds like a reasonable criticism, but maybe we do not have the time for quarrels over allocating blame. Chakrabarty argues that:

> [...] climate change would only accentuate the inequities of the global capitalist order as the impact of climate change – *for now and in the immediate future* – falls more heavily on poorer nations and on the poor of the rich nations. (Chakrabarty 2016:107, italics original)

Furthermore,

> Climate change is not a standard business cycle crisis. Nor is it a standard 'environmental crisis' amenable to risk-management strategies. The danger of a climate tipping point is unpredictable but real. Left unmitigated, climate change affects us all, rich and poor. (Chakrabarty 2016:108)

In many ways I sympathize with the criticism that has been raised against the idea that all of the humanity now sails on the same ship, and there are no life-boats, we are all in this together, rich and poor. Alfredo González-Ruibal insists that 'the human at the origin of the Anthropocene is predominantly white, male and Western, but also state-organised and modern' (González-Ruibal 2018:6). In my opinion to 'the blame it on the white, western male' is too simple: the freedoms of women have never been greater than in the modern western societies; women have also benefitted enormously from the last century's high energy consumption. Furthermore, the societal model called communism was not exactly free from polluting industries. Asian 'tiger' economies, with China in the forefront, have taken giant leaps into the modernity of capitalism during the last 30 years. The large cities of China are haunted by airborne pollution and smog.

As far as I can see all these societies have responsibilities for the past, present and future of the planet. We are in this together, and living in the Anthropocene as a species.

## How can archaeology contribute to studies of the Anthropocene?

Archaeology is a discipline that has the research history, theoretical perspectives, and the methodological tools to make a grounded contribution to the analysis of the Anthropocene. Archaeology has never been stuck in one of the two scientific cultures (Snow 1959 [1964]), as can be seen in the long tradition of cross disciplinary and ecological perspectives in Scandinavian, British archaeology and later New Archaeology (see Solli 2011:49–52 for references).

Riede refers to a prominent professor of climate and culture who argues that the humanities should be taken seriously in climate studies. This professor mentions the study of literature, history, and the finer arts, but not archaeology (Riede this volume:14). This omission of archaeology is a bit

depressing, and shows that even top academics at the University of Cambridge are unaware of both the research history of archaeology and ongoing environmental research on past societies. I agree with Riede when he states that 'we can only hope to truly understand climatic and ecological baselines if we look towards the past' (Riede this volume:16).

Since 2010 the term Anthropocene has been increasingly debated among archaeologists, for example in the special issue on the 'Archaeology of the Anthropocene' in the *Journal of Contemporary Archaeology*, edited by Matt Edgeworth (2014). When did the Anthropocene start? There is not space to take up this debate properly in this article, but I must admit that I find it quite meaningless when some archaeologists argues that the Anthropocene started with the introduction of agriculture, or even worse, when humans started to use fire.

Karl Butzer (1934–2016), a veteran in Environmental Archaeology, stated in a special issue of the journal *Holocene* in 2015, 'tangible human impact on global ecosystems was uncommon during the early Holocene times, while even robust mid-Holocene modifications are relatively scarce in many world environments' (Butzer 2015). Ruddiman (2003) drew attention to the accelerating build-up of atmospheric methane and carbon-dioxide from perhaps 6000 years ago. But given its scanty archaeological support, that trend also has other possible explanations and still requires rigorous study (Butzer 2015:1540).

In the case mentioned by William Ruddiman, humans have become environmental agents, not geological agents, which is what is on the agenda of geologists defining the Anthropocene. Humans in the epoch of the Anthropocene now 'wield a geological force. [...] To call human beings geological agents is to scale up our imagination of the human' (Chakrabarty 2008:206).

## What should we as archaeologists do?

We should enter the ongoing discussions of the Anthropocene, both since they concern archaeology as a discipline, and as researchers of the 'archaeosphere' and 'producers' of both tangible and intangible heritage. We could also, through archaeological methods used to study the archaeosphere, question the assumption that the beginning of the Anthropocene can be pinned down to a Golden Global Geological Spike (cf. Edgeworth et al. 2015; Edgeworth et al. 2019). Maybe the Anthropocene started at various points in both in time and space?

We also have a lot to do concerning the concrete challenges to archaeological sites, monuments and artefacts due to the Anthropocene. There is

no doubt that the Anthropocene must engage archaeologists all over the world. Not only melting of ice (Pilø et al. 2018; Solli 2018), but also rising sea levels, erosions, terraforming, migrations and so forth, will place heavy demands on us to step up our work in a rapidly changing world.

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# Re-wilding the Environmental Humanities

## A Deep Time Comment

Christina Fredengren

In Deep Past – Deep Futures Felix Riede favourably raises the questions of how the humanities, particularly archaeology and heritage studies, can meet the planetary challenges of the Anthropocene: the time when humans have crossed over from being a mainly cultural actor to becoming a geological one. At one level it seems that Riede shares Haraway's (2016:100) concerns 'to make the Anthropocene as short/thin as possible and to cultivate with each other in every way imaginable epochs to come that can replenish refuge'. This according to Riede is to be achieved through archaeological storytelling across the subject's internal divides, with a particular 'palaeo' element in order to engage with the emerging field of the Environmental Humanities. Archaeology, as implied in the heading of the paper, supplies the building blocks of Riede's Deep Pasts and Deep Futures. Palaeoarchaeology in the Riede version mainly seems to contribute to baseline studies on climate, ecology, past societal collapse and heritage studies with reflections on nationalism and identity (local, national and so forth). As Riede's figure 1 suggests, such studies would focus on the shared temporal window in which shallow and deep time disciplines meet.

That is of course all good and well, but Riede seems to skim lightly past significant parts of the knowledge genealogies of the Environmental Humanities. This field of research – which has summoned its powers in the

Archaeological Research Laboratory, Department of Archaeology and Classical Studies, Stockholm University
Email: christina.fredengren@arklab.su.se

last 10 years or more – has a grounding in a plethora of humanities disciplines including post-colonial studies, gender studies and environmental philosophy, all of which concern power inequalities and disturb the figure of the human. It has grown from science and technology studies, via new materialism, into studies of human-animal relations and beyond, and is a growing intellectual, global movement (Emmett & Nye 2017). Thus the Environmental Humanities have the potential to change humanities as a field in itself as well as the power to engage with the urgent matters of today through interdisciplinary collaborations, with far-reaching implications for both archaeology and heritage studies.

However, and somewhat surprisingly, the paper does not quite connect with how a new range of prominent scholars have occupied themselves with in particular Deep Time matters in recent writings and by that omission Riede narrows down what the Environmental Humanities is and could be.

## Troubles of Deep Time

Many researchers alert us that we are in Deep Time Trouble, where archaeology may be part of the problem as well holding the potential for new avenues of research. As stated by one scholar, Bird Rose (2013:1) '[t]ime and agency are troubled, relationality is troubled, situatedness is troubled. We are tangled up in trouble'. So, what is meant, why are time and temporality in trouble?

Bird Rose's (2013) reasoning draws on Chakrabarty's (2009) foundational paper *The Climate of History*, an eye-opener which shows that it is no longer possible to continue writing history in the traditional ways. First of all, the Anthropocene blurs the boundaries between nature and culture, so that human history can no longer set apart from the deep registers of natural history. Second, the climate crisis has put an end to many of the ways western history could be told, where former history writing has cherished modernity, mastery of nature and freedom, as for example in the movement of goods and capital. While such history-writing has interlinked with the global history of capitalism, it has done so without realizing that such progress came at an exceptionally high price for a range of othered humans and for the environment. Importantly Chakrabarty (2009) questions the 'we' of the Anthropocene and underscores how we are not all in the same boat: poverty lines divide the human species and people's ability to cope with environmental change are very unevenly distributed. Chakrabarty (2009) points out that the historical narratives at hand do not prepare us well for the unfathomable and environmentally challenged futures to come. In here lies the call for new ways of storying planetary time.

Engaging with Deep Time in the humanities thus also means, as aptly pointed out by Parikka (2016:201), engaging in time-scales that 'are not necessarily authored only by the loose category of humans' and being alert to encounters with the non-human and its various temporalities. It is important not to turn a blind eye to the disrupting powers of environmental catastrophes and fracturing of time prevalent in earlier events, scholarship and storytelling (Ghosh 2016). However, there is a great urgency to acknowledging the significant forces and vivacity of non-human temporal authorship across both natural and humanistic sciences, in order to recognize ruptures of catastrophic times both in the past and those that might happen in futurity, and hence we need to break out of our designated temporal windows.

Other emergent temporalities need also to be heeded here: Rob Nixon (2011) has explored how oil spills, toxic wastes from industrial accidents such as that of Bhopal, or nuclear disasters of Chernobyl, have had formerly ignored effects that spread out, seep into and influence the lives of humans, animals and crops over longer periods of time. These are captured by the concept of *slow violence* that focuses on the uneven distribution of toxic burdens and place and brings attention on the drawn-out temporalities of environmental harm. Moreover, this notion of slow violence also underscores the critical question of the 'we' of the Anthropocene as people are differently situated and exposed to its workings, with the death count in the global south on the rise. Environmental problems move across conceptual, spatial and temporal scales (Parikka 2016) and in effect such slow violence stretches in-between, affects and connects not only human, but also multispecies generations in uneven ways for times to come. Furthermore, I do want to point out that it is urgent to map how temporal relations are challenged and negotiated in these troubled times and to expose the politicization of the long-term. It is both a question of human-animal relationships and extinction stories, but also how actions today affect future multispecies generations. In this lies the urgency in how to figure out possible paths for future human and more-than-human conviviality under adverse climate conditions.

## Deep Time interventions

The plastic waste that infiltrates water systems and forms layers on the seabed, as well as in landfills; toxic waste and fertilizers which follow rivers and cause bottom-death and species depletion at sea; these can be registered as Anthropocene archaeologies. It is important to note such heritages, where human and more-than-human actions leave marks in the sediments of the

planet, but it is not enough to ask only what meaning they have: we need also to track how these work and have material effects that stretch into a variety of futures. As suggested by Parikka (2016:283) these effects need be better documented in order for us to follow the flow of materials and their biotoxic workings, instead of just excavating their cultural meaning (which may have been the priority for a postprocessual archaeologist; perhaps this is what Riede alludes to with the wide swipe on postmodernism?).

Radiation, pollution, species loss, biotope changes, but also gene-editing techniques make *deep time interventions*. There are several material features, including heritages of all kinds (from collections, to landscapes, to nuclear power or climate change) that implicate and sign up future generations for coming duties of care: a study of Deep Time includes a tracking and understanding of these. As Sarah May (n.d.) has pointed out, heritages may not always be of the wanted kind. And in particular the inheritances of environmental degradation may indeed form a part of such unwanted heritage, which will stretch over several generations to come and even into generations we may not recognize as fully human and generations that might not be human at all, but more-than-human. In effect, these interventions rein in the freedom of not only present, but also future generations. This in ways that range beyond our present humanistic imagination (Åsberg et al. 2011; Holtorf & Högberg 2016). Furthermore, as Bird Rose (2013:7) alarmingly speculates, 'our past is now racing towards us from the future', meaning that a variety of temporal interventions overwhelm us in presents to come.

Not only is time bending in the way Bird Rose (2013) discusses, but curiously, nuclear reactions and the radiation of the atom bombs, so to say, twist time in other ways, both at micro and macro level. Besides serious adverse effects on ecosystems, they also affect our ability to probe archaeological deep time with radiometric dating, since they disturb the equilibria and abundance of long-lived radioisotopes in the biosphere. Hence, such events are affecting the ways archaeologists carry out the most commonplace linearization of time, through radiocarbon dating. Furthermore, climate change, environmental problems, Anthropocene accumulations and depositions all disturb layers of time and temporality by affecting the pace through which materials in designated heritage collections erode, how they are infiltrated by chemicals and toxic compounds, which affects diageneses – how materials level out with their environment. Not only are archaeological materials polluted by Anthropocene actions, but the times we live in also demand other analytical tools and imaginaries to deal with time and temporality.

As expanded upon in Fredengren 2016 (and therein cited works), archaeological remains occasionally appear unexpectedly and disturb the chain of events in modernity, contributing to clashes and disjunctures in

time. Encounters with materials from deeper temporal strata can give rise to what are captured as enchantment effects. Such emotional upshots have been seen by Bennett (2010) as important in the processes in which people step up from environmental ethical thinking to real environmental action. To some extent we live in haunted landscapes (Gan et al. 2017), where such pressing temporalities can be captured as Derridean hauntologies (Fredengren 2015, 2016), where we are bothered and spooked by both pasts and futures, injustices, extinction histories, and how these are stitched into the fabric of the world, where if not our present, then future generations will reap what was once sown. In order to fathom how we, as the climate activist Greta calls it, steal from future generations, we need to make inventories of Deep Time interventions and highlight when these take place, to be able to understand better how actions of the past infringe on the future.

## The queer temporalities of the Anthropocene

To engage in Deep Time thinking, besides writing history in other ways, also means working on other temporal registers, and probing into how temporal workings themselves structure how we relate to each other through time. The term *chrono-normativity* has been used by Freeman (2010:xxii, 3) to describe 'the interlocking temporal schemes necessary for genealogies of descent and for the mundane workings of domestic life' and 'the use of time to organize individual human bodies toward maximum productivity' (Freeman 2010:3) or in retrofilia, which is probed into by Fjelkestam (2018). However, the term can be favourably adapted to critique the temporalities of modernity – the clock time, factory time, time-management that so many modern institutions are built upon – and to challenge these for to enable alternative ways of forming relationships. Furthermore, as Bastian (2012) articulates, such calendars and clocks also structure power relations, where your timeslot directs my time-choreography and where the temporalities of a range of different non-human others are not related to, but ignored. Bastian asks, are there ways in which time and calendars could be designed elsewise, for us to build more sustainable relations. This is a very apt question for an archaeological enquiry into deeper time stretches: how could material processes, times and temporalities, and relations be knotted together elsewise and in less damaging ways? How can our temporal appreciation and language be improved and stretched? Do deep time interventions need to be marked in people's lives, through exhibitions, apps or ceremonies?

Taken together, the argument within recent Environmental Humanities writing is that the temporalities that modernity is built on are over, they are damaging, they have passed their expiration date. Here is also my main

worry with Riede's exposé in the Deep Time, Deep Past keynote. It favours a continuation of archaeology as it has always been, with palaeo-ecological contributions to climate modelling, but misses the long discussions and ethics-infused scholarship within the field of Environmental Humanities which have engaged with deep time, deep pasts and futures from a much more inclusive horizon. For that reason (I guess) he gets stuck in thinking that Environmental Humanities only engage in the recent past while the whole texture of time and temporality are in fact under scrutiny. I have in several papers lifted my concern about the flat presentism in many heritage studies (Fredengren 2015, 2016), but that problem – and the current predicament – may not be particularly assisted by singing the praises of and falling back into a restraining chrono-normativity of palaeo studies, and dividing such studies into shallow- and deep-time disciplines, just as if nothing has happened or is about to happen though climate change. Instead we need to follow the odd temporalities of slow violence, extinction and decay, and deep time interventions, and see what futures they lead us into and what relations they imply and what futures are in the making.

## Gender studies and the Environmental Humanities

It is against this background I also see Riede's narrow reading of Braidotti (2018); a paper that is not about scrapping Environmental Humanities as if it were a fad, but instead an airing of disappointment at how Environmental Humanities has been taken into the metabolisms of the university system as if it were business as usual. As an alternative, the paper lifts the game-changing notion that 'the proper study of the humanities is no longer "man"' (Braidotti 2018:5) – and here we are not only talking about the nurturing support systems of the old-boys networks – but something far more wide-reaching: critiquing power structures that are fundamental and limiting for western academia. Such structures we cannot afford to keep given the present predicament.

The argument of Braidotti (2018) is rather that two newcomer stars to the disciplinary scene of the humanities – Environmental Humanities together with Digital Humanities – all too easily find themselves framed with a cognitive capitalism, thereby losing their critical edge and transformative powers, instead of finding new and vital transversal connections. Hence, is there really a need to cement what archaeology contributes to the Environmental Humanities? Why ignore important scholarship on for example human-animal relations and gender (cf. Jennbert 2011; Haraway 2016; Oma Armstrong 2018)? Is it not more urgent to creatively and constructively find new routes for research and fresh alliances and research collaborations

with the excitement of what each and everyone brings to the table? Is it not the time to explore how the links between university environments and other institutions can be strengthened or how citizens humanities can be practiced in for example museum environments, and how to form hybrid and open learning environments?

## Heritages in the Anthropocene

My own contribution to the Environmental Humanities, at present, comes through interests in temporality, water, human-animal and intra-generational relations, care and a critique of gendered power structures, as well as a curiosity into how sustainability could be configured in more creative ways to meet with the heritage sector and the more-than-human. To cement the relationship between the Environmental Humanities and archaeology is also a way of denying the urgency of these environmentally challenged times – which require unprecedented transitions as stated by IPCC and quoted in the beginning of Riede's paper. Why should we put the lid on, set a frame around the subject before it has reached its potential – where a restructuring of both academia and the impact of the humanities field is more urgent than ever.

At the same time, while many scholars problematize the connectivity between heritage and human identity, not only due to its anthropocentric connotations, Riede (this volume:17) seems to fall into an identity trap. This by simply celebrating identity as a major *raison de être* for heritage, whereas the challenges of linking heritages to identities is a well-rehearsed field in critical heritage studies, which have taken this knowledge onboard and moved on to discuss nature-culture relations and heritage futures (cf. Harrison 2015). Here, I have written on several occasions (Fredengren 2012, 2015), that whilst biases and injustices based on identity in heritage selection need to be noted (an obvious one is the anthropocentric focus and how to move beyond 'man'), resolution does not necessarily lie in a further lock-in into similarly oppressive identity categories. Further, there are other pressing issues related to heritage studies that need attention (see Fredengren & Åsberg forthcoming).[1] The making and labelling of heritage is a part of a variety of material and immaterial processes with a very political interface – one that literally shapes the fabric of the earth, makes it appear

1 Some of these thoughts are already anticipated and will be published in a paper by Christina Fredengren & Cecilia Åsberg in connection with the UCL conference proceedings *Deterritorialising the future*. Many of the ideas have been conceived through relations with Edinburgh Environmental Humanities and explored in our Formas-funded project Checking in with Deep Time – Intragenerational justice and care.

as material phenomena, makes it work in various temporally situated political strategies. Such strategies need to be mapped and critically reviewed in order to open up a discussion of the often under-articulated politicization of the long-term, where the livelihood of future generations is facilitated or reined in. But there are also other ways to fold out heritage places in conversation with the Environmental Humanities field. To engage with such places draws us into paying close attention to the mixed and temporally queer environments we live in: constitutive parts of our situated and materialising political ecologies.

Moreover, as mentioned in Fredengren 2012, 2015, heritage is increasingly linked to sustainability – to the extent that possibly a new sustainable heritage paradigm can be spotted on the horizon (cf. Albert 2015). Here, it is important to keep a critical eye on both emerging and intertwined discourses of sustainability and that of conservation (Alaimo 2012), but also to make moves beyond using sustainability as a window-dressing exercise while the heritage-making process continues as before. It is important to focus on risk mitigation, but also to deal with transformation and loss linked to heritage (cf. Holtorf 2018). Furthermore, there is a need to revisit conservation, as Da Silvey (2016) has done, reframing it as a type of curated decay. Perhaps this reasoning from heritage studies aids us in practising the art of letting go, which talks to other faculties of the human, even from the viewpoint of being an endangered species. Going further, there is also room for creativity and affirmation, to capture the societal urge for creative re-use, re-work, and re-cycling of heritages of the past and moving beyond a 'human-only' or anthropocentric sustainability paradigm to envisage more inclusively that future generations are multispecies entanglements of humans and more-than-humans, and explore what intra-generational care could be (Fredengren & Åsberg forthcoming). Here I am not as negative as Riede (this volume:19) about using archaeology or ethnology for finding useful ecological knowledge or knowledge of other ways of relating to humans, animals or the environment to get on in a changing world. More importantly (and in line with Haraway 2016:100) our general field of study allows for situated knowledges for finding both practices and places for human and animal refuge, this by paying close attention to space, place and materializing temporalities.

## Undisciplined Environmental Humanities

To sum up: the reasoning around the Anthropocene starts with a sobering clarification – human agency has not only created high culture, such as buildings, tools or art, by its actions. What are left are also heritages of

species and gender inequalities, scarred landscapes, waste, toxicities, species extinctions, mono-cultures, layers at the beds of oceans, climate and environmental change. This is a mixed heritage (often unlabelled) that is the result of material interferences that change the textures of times, that territorialize futures to come, that shape the spaces and cartographies within which future (multispecies) generations can manoeuvre.

I ask again, with Haraway (2016:100), what measures need to be taken to make the Anthropocene as thin as possible? What are the means with which the humanities, however loosely formed, can contribute with towards that end? Here I share the visions of Riede, but find the paper somewhat limiting. Does the present predicament not demand of us a more undisciplined academic encounter – and a rewilding of the humanities – to form these transversal modes of querying past, present, futures? Does it not need a lot of creativity to find a range of engagements, knowledges and inspirations to work elsewise? What interests me is how to expand on scientifically informed multi-species storytelling, with a base in archaeological materials that deals with how to tie human-animal knots and temporal relations in other ways. There are other ways to relate to and be related to by the environment (see Fredengren, this volume). For such it is very premature to set boundaries for what archaeology may bring to the Environmental Humanities table, as both subjects are on the move.

Likewise, I ask how heritage is captured as time elements, in presentisms, in merges of materialities and meaning, in troubled bodies, in how to deal with anthropocentrism in heritage making, how to capture heritages as process ontologies as human-animal relations (Fredengren 2015, 2018). I also ask what modes and models of stewardship (who cares for whom, according to what ethic and on what mandate) come with the heritage business? I am curious about people's relationships with the more-than-human, with things, place and spaces, and with care and curatorship in a wider sense. However, I do not envisage the meeting between environmental humanities and archaeology to be limited to these matters, but to be developed through various creative and affirmative encounters.

And then I ask … for what causes do we do this? Is it to establish subject boundaries and to carve up academic terrain, or for forming new types of unexpected collaborations? And perhaps, at the end of the day … as many of us would say, don't we do it … for the love of the world?

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# Environmentalism as Religio-Medical 'Worldview'

## New Synergies Between the Palaeo-environmental Humanities, Ecological Public Health, and Climate-Change Activism

Julia Shaw

## Introduction

In his keynote paper, Riede (this volume) has presented a strong case for greater integration between archaeology and the aims and objectives of the environmental humanities including a much needed departure from the geosciences:humanities polarisations that underscore prehistoric and historic research areas. In this response I suggest three additional interdisciplinary alignments through which Riede's 'palaenvironmental humanities' programme might be further enriched.

First, I argue that more emphasis needs to be placed on the belief structures and 'worldviews' – religious, medico-environmental, or otherwise – that underscore the development of regionally and historically specific environment:human interactions and outcomes. Closer engagement with the anthropologies and text-based studies of religion is crucial if we are to move away from the prevalent focus on the technological drivers and solutions to climate change and environmental imbalance, and to give more weight to the underlying worldviews that perpetuate narratives of control

University College London, Institute of Archaeology
Email: julia.shaw@ucl.ac.uk

over 'nature'. There is a tendency within environmental archaeological accounts to simplify and generalize religion as a discrete set of theologies and practices marginal to mainstream socio-economic concerns, rather than as 'worldviews' that pervade multiple dimensions of agrarian, technological, culinary, medicinal, and socio-economic life, and which are crucial for understanding the cultural and mental obstacles to tackling unhelpful socio-natural dynamics.

Second, I argue for closer engagement between the environmental and medical humanities and recent strands of biomedical and public health enquiry such as Planetary Health and One Health agendas (Watts et al. 2017; Whitmee et al. 2015), that highlight the deeply entwined environment:human health outcomes of unsustainable environmental practices. I draw in particular on developments within Ecological Public Health discourse (Rayner & Lang 2012; Morris & Saunders 2017) such as epigenomics and the related exposome concept (Wild 2005; Lioy & Rappaport 2011; Betts 2012; Buck Louis & Sundaram 2012; Miller & Jones 2014), which by emphasizing lifetime and intergenerational health impacts of environmental exposures help to break down the nature:nurture division that has traditionally separated the environmental and medical sciences from their humanities counterparts. In particular, the recognition of the combined human, environmental and climate-change impact of synthetic chemical use and waste (United Nations 2019) is important for broadening the rather myopic emphasis within recent scholarly and activism contexts on 'climate change' as the predominant fallout of unsustainable environmental practice, rather than as just one of its many symptoms.

Finally, and closely related to first two themes, I highlight the relevance of community forms of environmental control both past and present as a temper to the traditional emphasis on state-led environmental and ecological health-oriented directives. Not only do historical examples of community action, including those connected with 'religious governmentality' (Shaw 2016a), help to build more nuanced models of human-environment interaction in the past, but they are also instructive for present-day environmental and climate-change activism and for challenging the view that solutions to the human-environment imbalance depend largely on synergies between scientists and governmental legislators (United Nations 2019), whose own economic and political agendas are often at odds with the needs and interests of ecological public health and wellbeing. This is particularly crucial today when environmental activism is regarded as 'subversive civil disobedience' (Luke 1999) that may pose a threat to 'national economic security' (Newlands 2018).

## Archaeology as Environmental Humanities: 'Worldview' and religion

My first suggestion is that archaeologists engaged in environmental and climate-change research need to give further thought to the underlying belief structures and 'worldviews' that shape attitudes towards the environment, and consequently long-term environmental and human-health outcomes. Although certain environmentalist positions have been described as forms of 'secular religion' (Latour 2013; Shaw 2016b), many such attitudes are related to deeper human:environmental epistemologies rooted in religio-philosophical thought. For example, while Rachel Carson's (1962) *Silent Spring*, cited as one of the major drivers behind the western environmental movement, drew largely on language of marine biology and toxicology, the other major influence in environmental humanities discourse is Arne Næss' (2003) 'Deep Ecology' which was closely aligned with specific religio-philosophical theologies such as later Buddhist notions of the Origination in Dependence (Dorje 2006: 1095).

Such alignments have been helpful for challenging western, and capitalist, worldviews based on the inherent separation between human and environmental welfare. Hence a growing religion-and-ecology discourse that has developed into a discipline its own right with several key journals, academic centres and discussion forums (Grim & Tucker 2014). However, archaeology has remained notably absent from such developments, mirroring its general dislocation, as discussed by Riede (this volume), from the broader environmental humanities. A recent major volume on religion and ecology, for example (Tucker et al. 2016), includes not a single archaeology-oriented contribution, and despite recognition by climate-change scientists of the importance of religion in disaster relief planning (Chester 2005; Hulme 2016), archaeology does not figure in such discussions. Not only does this impoverish archaeological accounts of major environmental change by perpetuating the emphasis on environmental technologies at the expense of the deeper and often multi-stranded religio-philosophical influences and outcomes of human:environmental transformations. But it also means that many idealized versions of environmentalism in antiquity go unchallenged, as highlighted in recent religion-and-ecology accounts of the supposed environmental focus of early Buddhist and Hindu thought (Shaw 2016a). In recent years archaeology has been instrumental in challenging some of the underlying premises upon which such discourse is built, particularly the utopian vision of, for example, India's pre-modern environmental past based on a universal reverence towards its primordial, untouched forests (Morrison & Lycett 2014). For example, recent studies have demonstrated

the long-term occupation of areas previously thought of as 'virgin forest' in Southeast Asia and the Amazon (Clement et al. 2015; Evans 2016) while evidence for the deep historical exploitation of forest products in India has highlighted the social construction of forests as the 'wild' other of cultivated agricultural zones, disconnected from broader networks of economic agency (Morrison & Lycett 2013, 2014).

Many other idealized accounts of traditional engagement with the environment need to be tempered by the diachronic perspective offered by archaeology, but equally the other way around, there is much scope for archaeological understanding of the environment to be broadened and contextualized through recognition of the religio-medical worldviews that shape socio-natural trajectories. Further future research challenges include questioning the multiple points of convergence and divergence between specific religious and 'scientific' environmental 'worldviews' and perspectives. For example, in many cultural contexts religious frameworks of understanding are the primary modulators of empirical knowledge about humans' place in the world, and for codifying frameworks of purity or cleanliness versus pollution or dirt, or of harmful versus safe human:non-human relationships (Shaw 2013, 2016a). This may be contrasted with secular contexts in which scientifically driven government legislation is often the last word for determining beliefs about climate change, environmental health, disease aetiology, and related consumption and lifestyle choices that impact on global climate patterns (Holm et al. 2015; United Nations 2019).

What is needed therefore is greater exploration of the worldviews and mindsets that shape consumption and behavioural patterns which perpetuate unhelpful human:environment relationships. As discussed later, a similar recognition is at the heart of emerging ecological public health and 'exposome' discourse (Miller & Jones 2014), aimed at highlighting the porosity between humans and their environment. Further, the question of how traditional definitions of sacred/pure v. polluted spaces, objects or foodstuffs correspond with modern medical and toxicological notions of cleanliness and 'hygiene' v. pollution deserves further archaeological investigation (Shaw 2016a; Shaw & Sykes 2019).

This is especially important in the light of Riede's (this volume: 18) comments about the potential dangers of fixing the onset of the Anthropocene exclusively in the nuclear age, with the result being that the 'pre-1950s past [is relegated] to some politically largely irrelevant "pre-Anthropocene"'. While it is important not to underplay the particular gravity and uniqueness of our current environmental crisis, whose close link with other toxic innovations of the petrochemical and agro-pharmaceutical industries, and associated use and disposal of synthetic chemicals on an unprecedented scale (United Nations 2019), set it apart from pre-industrial examples of

human:nature entanglements (Hodder 2012), we should also question the potential points of convergence between historical and modern notions of environmental pollution.

Such an approach would allow for the testing of what are sometimes over-idealized accounts of the potential for religious attitudes towards health and environment to shape modern responses to both medical and environmental challenges (Shaw 2016a). An often-cited example of clashing perspectives here is the Indian river Ganges (and the Yamuna) whose traditionally purifying waters are, within the language of environmental science, sources of hazardous industrial waste, untreated sewage and decaying human corpses (Alley 2002; Haberman 2006). Hence the revisionist picture of Hinduism as a distinctly *anti*-environmentalist tradition, which, through a belief in the Ganges' inherent purifying qualities, is able to transcend (and ignore) the 'reality' of a worsening environmental crisis. And yet there are important convergences between traditional and modern constructs of landscape and human wellbeing that offer useful scope for future environmental remediation and for mediating between the realms of superstition to those that foster constructive dialogue between traditional and modern religio-medical worldviews (Shaw 2016a; Yeh 2016; Yeh & Coggins 2014; Shaw & Sykes 2019).

Despite rather belated attempts to highlight the relevance of environmental archaeology to Anthropocene studies and climate change research (e.g. Ellis et al. 2016; Murphy & Fuller 2017), largely on the basis of deep-time human:environmental entanglements as represented by Neolithic agricultural innovations, envisaged collaborative frameworks tend to be limited to the environmental sciences, and the foci of enquiry, with recent exceptions (Lane 2015; Shaw 2016a), restricted to providing empirical evidence for practical and material responses to climate change and extreme environmental events, as relevant models for present:future challenges. For South Asia, my own research region, any serious consideration in such discourse of how posited changes in food production impacted upon and were digested by religio-philosophical traditions or by groups concerned with human health and wellbeing is notably absent, while archaeobotanical accounts of later agrarian shifts such as the spread of rice during the early-historical period, engage with religion, ritual and ethical concerns only in the most superficial and generalized way. Ritual is commonly treated as a discrete set of practices and theologies operating at the margins of society and disconnected in a polarized fashion from economic and technological spheres, as illustrated by recent discussions of whether rice in South India was being cultivated as an economic or 'symbolic' crop (Kingwell-Banham 2019).

Such attitudes reflect a dislocation from scholarship on religion-as-worldview that underscores major dietary trends and attitudes towards

the body, and overlaps closely with medical and environmental worldviews (Shaw & Sykes 2019). Other more nuanced accounts (Morrison 2016) refer to the 'ritual' status of rice while at the same time overlooking the highly divergent attitudes, both within and between religious communities and castes, towards different grains and their physical and 'energetic' impact on the body, with precise classifications and taxonomies that regulate the production and consumption of different foodstuffs varying according to different religious contexts (e.g. ascetic v. devotional).

There are additional disparities between the perceived ritual and health properties of rice: despite its much heralded 'auspiciousness' in Brahmanical temple ritual (Morrison 2016), irrigated rice and cultivated cereals in general were arguably rejected by Brahmanical ascetics in favour of horticultural-oriented food production, due to perceived links with harmful (*hiṃsic*) human:non-human dynamics, and new 'urban' illnesses arguably connected with the birth of the Indian Ayurvedic medical system (Zimmermann 2004:274; Shaw 2016a).

This last point provides caution against overlooking divergent and often conflicting worldviews within single temporal or spatial scales, but also emphasizes the need for greater synthesis at the level of fundamental research design (including the choice of sites chosen for sampling), between the polarized science and humanities 'camps' that hamper the development of integrated socio-natural histories.

## Archaeology, the medico-environmental humanities and biomedical research: A new entanglement?

My second suggestion, focusing this time on the *medical* worldviews that underscore changing human-environment entanglements, is that to Hulme's snapshot of 'humanistic disciplines producing relevant climate and environmental knowledge' (Riede this volume: table 1) should be added a number of key developments within both the medical humanities and biomedical sciences that demonstrate how our synthetically altered environment is changing human and non-human animals at an intergenerational level through epigenetic, genetic and endocrine disruption (DellaValle 2016; Parry & Dupré 2010; Dupré 2016; Genuis 2012; Mostafalou & Abdollahi 2013), and by extension that healing of the human body needs to go hand in hand with healing of the environment (Shaw 2016a, 2016b). The epigenetic model, and the related 'exposome' concept (Wild 2005; Lioy & Rappaport 2011; Betts 2012; Buck Louis & Sundaram 2012; Miller & Jones 2014) which refers to the summation of 'environmental influences and associated biological responses throughout the lifespan, including exposures from the environ-

ment, diet, behavior, and endogenous processes' (Miller & Jones 2014), introduce a crucial medical perspective to the deep-time human:environment 'entanglement' theme in archaeology (Hodder 2012) and the broader social sciences (Latour 2013). They also intersect closely with new sustainable development models (United Nations 2015), and related medical initiatives such as Planetary Health, One Health (Watts et al. 2017; Whitmee et al. 2015) and Ecological Public Health (Morris and Saunders 2017) agendas that recognize the health impact of our global environmental/climate change crisis (Shaw 2016b).

Crucially, these approaches have shattered old nature:nurture divisions, by emphasizing the 'permeability between humans and their environment' (Morris & Saunders 2017:21) through the articulation of the means by which both interact to alter gene and endocrinal behaviour (Miller & Jones 2014). The western medical view of the self-contained human body impervious to its surroundings is now seen as 'distressingly porous and vulnerable' to both the physical (Nash 2006:13) and socio-cultural landscape (Morris & Saunders 2017) in which they live. Indeed, the exposome model is described as an 'integrated science of nurture' (Miller & Jones 2014) that helps to 'fulfil the promises of the Human Genome Project' by elucidating the 'imbalance in the nature nurture interaction' and the 'interactions between our genes and our environment that determine health and disease'.

However, despite recognition of its relevance for environmental ethics in archaeology (Shaw 2016a) and bioethics (Lee 2017; Macer 2017), the epigenomic model, fundamental to the exposome concept, has been overlooked within broader discourse on the human:environment 'entanglement' theme. This is unfortunate given its scope for providing biomarkers for diachronic human:environmental intersections, but also for bringing 'green' agendas in the present into mainstream political activism. This is because it demonstrates most effectively that injury to the environment, of which climate change is but one outcome, can no longer be dismissed as something 'out there' that does not impact on human wellbeing unless one is affected directly by extreme weather events, but that conversely, as we alter our environment, so too are our bodies being changed (and damaged) through endocrinal and epigenetic alteration. It can also be applied fruitfully to challenge one-sided interpretations of environmentalism as being concerned with 'nature' as an entity removed from humans that underscore some of the more idealized accounts within religion-and-ecology discourse: much of the emphasis of early religious 'environmentalism' is focused on care towards animal welfare rather than to the human fallout of environmental stress (Shaw 2016a).

The growing interest in 'environment and wellbeing' offers particular scope here for bridging some of the aforementioned methodological and

theoretical divisions between the bio- and environmental sciences, and their humanities-orientated counterparts (MacBride-Stewart et al. 2019; Shaw & Sykes 2019) including various initiatives in the realm of 'ecological public health' (Morris & Saunders 2017). A key aim of the latter is to understand and address the relationship between environment and human health and wellbeing 'on vastly extended temporal and spatial scales' (Morris & Saunders 2017), with this diachronic emphasis offering obvious scope for archaeological input. Although not aligned in any explicit way with epigenomics, instructive examples of recent tie-ups between archaeology and biomedical research in this respect include evolutionary assessments of diabetes epidemiology (Wells et al. 2016) and gut microbiome health (Schnorr et al. 2016) that draw in part on broader archaeological evidence for the impact of the global shift from hunter-gatherer lifeways to domesticated agriculture during the Neolithic on human vulnerability to climatic instability and crop failure.

Others (Baker 2018) have examined Roman concepts of health in relation to air quality, albeit framed predominantly from the perspective of wellbeing rather than toxicology and environmental health (Shaw & Sykes 2019). Such discussions can be situated usefully within historical scholarship on gardens and 'pleasure groves' in antiquity as places of healing (Ali 2003) as well as modern public health discourse on ecotherapy, and 'nature' and wellbeing (Burls 2007), with the primary emphasis being on the psychological, sensory and experiential benefits of nature immersion, especially in childhood. However, the less pleasant sensory experiences that Baker (2018) alludes to in her discussion of 'bad' or putrid smells in antiquity have an obvious bearing on ecological public health discourse which has demonstrated that air pollutants are not just 'unpleasant' but can have a profound impact on physical health. Although recent media accounts and governmental reports have painted the distorted picture of 'air pollution' as standing solely for vehicular fumes (NICE 2019), studies on both outdoor and indoor air quality (Genuis 2012; Mostafalou & Abdollahi 2013; United Nations 2019; WHO 2016) have stressed the mutual link between major chronic illness and pollution using a much broader frame of reference – including synthetic chemicals and waste, plasters and paints, perfumes, cleaning products, pesticides and antimicrobials, wall and floor materials, poor ventilation, and damp and mould – that lends itself well to future avenues of archaeological enquiry (Shaw & Sykes 2019).

Central to the ecological public health agenda is a belated admission within the medical research community (Morris & Saunders 2017) of a failure to engage in a timely manner with the pioneering arguments of Rachel Carson (1962) regarding the negative human and environmental health impact of synthetic biocides and related chemicals, and the disloca-

tion between the human and 'natural' worlds that underscores the quest for profit (Rockström et al. 2009; Steffen et al. 2015). Although it is now widely accepted that synthetic chemicals are impacting on both human health and global climate-change in unprecedented ways (United Nations 2019), we need to give serious thought to the reasons why it has taken over 60 years for Carson's views to be taken on board by mainstream science, so that the remaining obstacles towards effecting remedial action might finally be tackled.

It is an unfortunate reality that similar health and environmental concerns expressed about various emerging threats from lead poisoning, to cigarette smoke, to climate change itself, have initially been dismissed as conspiracy by both industry and the public alike. Although the emerging ecological paradigm of medicine has demonstrated the environmental basis of various stigmatised and hitherto poorly understood illnesses (Genuis 2012), translating such findings into clinical, legislative and social contexts is a frustratingly slow process, just as the now-established germ theory that preceded it was also met, initially, with disbelief and hostility (Williams 2007). Aside from the multiple economic and political issues at stake, again we return to environmentalism – and indeed medicine – as forms of belief system, with the rejection of well-reasoned warnings evidently drawing on mindsets that have allowed 'human beings [to] have lived, moved, consumed, and pursued health and well-being as if humankind is distinct and separate from nature rather than integral to it' (Morris & Saunders 2017).

Here the 'social' model of illness (Cross 2007) and related developments in archaeology (Davis 2005) are particularly instructive, illuminating as they do the social arena of medicine or healthcare as worldviews rather than as discrete practices that take place within specific settings (Shaw & Sykes 2019). Indeed, central to the aforementioned exposome model is the acknowledgement that the body's cumulative biological responses, 'adaptations and maladaptations to external forces and chemicals' are intricately bound up with not only endogenous processes including epigenetic alterations and protein modifications but also behavioural factors such as 'personal and volitional actions and those that result from family, community, or social units' (Miller & Jones 2014). This recognition is important given the close correlation between indoor and outdoor pollution, low building standards, and health inequality (Morris & Saunders 2017; Prüss-Ustün et al. 2016; Royal College of Physicians 2016; The Marmot Review Team 2010), with harmful environmental and health triggers often originating in contexts removed in both time and space. Because such '"distal" pathways of ecosystem damage to human health and well-being' can confer a 'temporal and / or spatial remoteness that diminishes the sense of urgency [...] a much fuller appreciation of the global connectivity of social, eco-

nomic, and ecological systems' (Morris & Saunders 2017:20; see also Morris et al. 2015; Adger et al. 2009) needs to stand at the very heart of future medico-environmental policy-making, in contrast to the current situation whereby regulations governing chemical use tend to be viewed as 'red tape' that stands in the way of economic progress and profit (Morris & Saunders 2017:21; Oldenkamp et al. 2016). Similarly, the United Nations' (2019) recent proposals for meeting its global synthetic chemical and waste management targets that formed part of its earlier 2030 Agenda for Sustainable Development (United Nations 2015), are framed exclusively within synergies between science and government legislation, with only marginal discussion of community input, and no consideration at all of religiously or culturally grounded environmental worldviews and attitudes.

Given the growing multi-agency commitment to tackling global environment-health challenges, there has never been a better time for archaeology to forge integrated links with the medico-environmental humanities and to demonstrate its unique capacity to provide diachronic insights into the global socio-ecological connectivities that drive the ecological public health project and similar initiatives. An additional and crucial challenge for the palaeoenvironmental humanities is to question how divergent and discordant attitudes towards the 'ecological public health' impact of anthropogenically driven environmental practices in the past played out at an archaeological level and influenced long-term outcomes. To what degree, for example, can differing regional patterns of agrarian technologies such as irrigation, crop use, animal rearing, and pest-control measures be related to underlying environmental ethics and to what degree are present-day ecological public health outcomes affected by such deep-time patterns (Shaw 2016b, and further papers in that volume)? Such questions are particularly important given the drive towards organic agriculture and sustainable water-use as measures for tackling the aforementioned planetary health problems and declining biodiversity levels (Sánchez-Bayo & Wyckhuys 2019).

Similar questions need to be asked of present-day human activities that impact on the environment. Might we expect, for example, those regions deeply aligned with 'Buddhist economics' (Harvey 2000; Shaw 2016a) and related notions of non-violence (*ahiṃsa*), to experience lower pesticide use? Whilst in Bhutan, Buddhist principles and a commitment to its 'gross national happiness index' are fuelling a drive towards an exclusively organic economy (Brooks 2013), justifications for pesticide use in other predominantly Buddhist regions can be unexpected. For example, in Thailand, the acceptability of pesticide use has been related to personal affordability (Harvey 2000: 166-168)! Other studies of 'Buddhist' environmental ethics and activism in Himalayan regions have highlighted unhelpful divisions between ritual/mythical and environmental/toxicological vocabularies and

points of reference (Yeh 2016; Yeh & Coggins 2014). Similar ironies and taxonomic clashes underscore the aforementioned examples of the Ganges and Yamuna rivers in India, and finding ways of bridging such discourses is crucial if the increasing prioritization of religious belief in global public health and environmental disaster relief (Chester 2005; Hulme 2010) is to prove effective.

## Deep-time perspectives on community-led environmental activism versus state 'control'

The assumption that an increasing movement towards environmental control is an inevitable component of the formation of states, empires and complex society, is still an underlying premise of the teaching of world history, even if, as highlighted by Riede (this volume: 19; also Riede et al. 2016; Shaw 2016a), this quest for human 'mastery' over 'nature' risks our ultimate loss of control over global stability and wellbeing. What is often missing from standard historical narratives of progress is critical discussion of the more negative fallouts of urban 'development' in the past, such as health inequality, poverty, and pollution, many of which mirror the mixed fortunes of rapid urbanization today. Similarly overlooked is the contribution of smaller, devolved, 'alternative', and often dissenting communities, and associated worldviews and attitudes, in the shaping of human:environmental worldviews and physical trajectories.

An example here is the enduring influence, in regions ranging from the Near East, through South and Southeast Asia, to pre-Columbian Mexico, of Wittfogelian (Wittfogel 1957) models of land and water control that assume the intervention of centralized state administration of land and water resources. In South and Southeast Asia, although many early dams are indeed commissioned by imperial forces, and may be regarded as 'Big Dams' in terms of size and scale (Morrison 2010), their administration and maintenance is often associated with forms of local elite patronage (Stargardt 2018), and overseen by village councils, and 'religious governmentalities' linked to Buddhist monasteries (Shaw 2007, 2016a, 2018; Coningham et al. 2007; Gilliland et al. 2013) or in later periods, Hindu temples (Morrison 2010). Moreover, many premodern dams in South Asia followed highly localised design models (Sutcliffe et al. 2011), while contemporary ethnographic accounts demonstrate highly codified rules of community reciprocity over access to water supplies (Agarwal and Narain 1997).

Archaeological correlates for socially and environmentally-engaged forms of 'Buddhist economics' (Harvey 2000) are instructive for the modern ecological movement in offering 'non-violent' examples of collective, ide-

ology-based, models of land ownership and management, whereby 'states within states' act as alternative agents of socio-environmental change, in contrast to the monetary outlook of modern development-based governmental agendas, or to the left-right political spectrum. However, while early examples of Buddhist 'monastic landlordism' evidently tackled socio-ecological sources of suffering such as poverty, lack of water and hunger, at a community level (Shaw 2007, 2016a), we should not assume an outright separation between 'Buddhist' and state-level economics. Similar ambiguities exist for later forms of Hindu temple-oriented land-tenure and water control, given the entwined relations between imperial rule and land-owning Hindu deities (Willis 2009), and the ubiquitous linkages between dam building and power and profit (Morrison 2010).

Whether part of integrated agro-economies or associated with dissenting groups that opposed certain forms of agrarian development (as with the aforementioned Brahmanical ascetic groups which rejected rice agriculture in favour of smaller-scale horticultural food production), such community responses to perceived socio-environmental and related human health challenges are instructive for modern environmental activism. This is especially clear given recent calls from public health theorists who stress the element of community responsibility as a tool for tackling current health challenges (Deprez & Thomas 2016). It becomes particularly significant given the recent rise in public, and especially student-led 'climate-change protests' aimed largely at shifting government-oriented environmental legislation and policy making (Taylor 2019). Still, one should not overlook the potential power of local community action to effect bigger changes at a global level through critical acknowledgement of how individual habits and their underlying human:environment 'attitudes' and worldviews contribute to the overall ecological public health picture.

In short, there is little point in campaigning for governmental action, until one's immediate living, working, or educational environments are put in order. This means living by example, through individual and collective adherence to new, revised (or old, as may be the case) attitudes regarding our modes of interaction with the non-human environment that surrounds us, and in taking on board shifting medical worldviews and associated research findings regarding the inherent porosity of the human-environment encounter. In addition to technological solutions such as 'green' chemistry and sustainable agriculture (United Nations 2019), more thought needs to be given to historical models of community action and administration and to the underlying human:environment epistemologies and worldviews that may help to explain differing patterns of regional environmental outcomes and solutions that in the end impact on planetary health at large.

## Conclusion: Reformulating environmental activism through an integrated palaeoenvironmental humanities programme

In order to fulfil the aims of a balanced ecological public health project, 'a total rethink of society, the economy, and our stewardship of the natural environment' is going to be necessary (Rayner & Lang 2012: cit. Morris & Saunders 2017:20), but also, for the development of nuanced, deep-time perspectives on such matters, new forms of interdisciplinarity within the broader remit of a palaeoenvironmental humanities programme are required. This means going beyond simply *engaging* with intersecting scholarly and activism-oriented debates, to actually reframing our research design along *active* collaborative lines of enquiry between environmental and medical scientists and their humanities counterparts, religious historians, as well as environmental / climate change activists and policymakers. In addition to researching and writing within such diachronic and interdisciplinary synergies, we should also be giving more thought to the ethical implications of our own actions and immediate environments as far as they impact on the growing crisis of climate change and environmental degradation. How might the indoor and outdoor spaces in which we live and work, for example, be adapted so as to act as showcases for our involvement in research agendas and ethics that highlight the long-term impacts of good environmental practice? By focussing on sustainable as well as healthy buildings and on integrated construction and management policies that transcend token 'green' initiatives and 'environmentally friendly' activities, we might also complement our formal research agendas with more outward demonstration of the multi-directional, inter-generational and interregional impact of individual, localized actions, consumption behaviours and engagements with the human:non-human:geological world.

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# The Paleoenvironmental Humanities

## Climate Narratives, Public Scholarship, and Deep Futures

Andrew P. Roddick

In his keynote, Felix Riede explores how archaeology might contribute to the environmental humanities, an arena he has recently entered with his new position at Aarhus University. Riede reviews the development of this relatively new interdisciplinary engagement and its contribution to climate change discussions. He suggests that we all should be involved in this conversation no matter our particular archaeological theoretical orientation. I particularly appreciate his position on the importance of narratives, his argument that deep human pasts must be foregrounded in current discussions of climate, and his view that strong, empirical evidence (particularly the kind produced in environmental archaeology) should be emphasized in these ongoing interdisciplinary discussions.

In this commentary, I consider how the environmental humanities could contribute to discussions of the climate crisis beyond our disciplinary spaces and our university settings. My response stems from non-European contexts. I am based in an anthropology department at a Canadian university, and conduct archaeological fieldwork in the Bolivian Andes, a region that is undergoing rapid climate-based changes. Concerns about climate futures permeate my conversations with Canadian students, where my teaching about the dynamics of past landscapes has gained new relevance in recent

Department of Anthropology, McMaster University
Email: roddick@mcmaster.ca

years, and with farmers in the *altiplano* of the Lake Titicaca Basin, who are observing vanishing glaciers and dealing with more frequent (and less predictable) droughts. As such, I'd like to further query how the (palaeo-) environmental humanities might be transformed not only through disciplinary archaeological practice but also through consideration of those we work with and for ('stakeholders'). I'd also like to consider further the relationship of these interdisciplinary conversations in terms of social transmission and futurities.

Riede begins his paper with a brief history of the environmental humanities, highlighting the absence of archaeology in the ongoing dialogues between humanities disciplines such as literature, sociology, and philosophy (among others). He questions our own sub-disciplinary silos, suggesting that environmental archaeologists tend to work in deep prehistory, whereas those working in the recent past and present tend to neglect human:environment relationships. I think perhaps he overstates such a division. I see many of the more exciting areas of research not falling into such categorization. (And what of the various political ecology-driven studies of both the recent and deeper past?). Nevertheless, I find his argument for including the 'palaeo' in the environmental humanities compelling, a move that, among other things, might problematize our rather dystopian belief that late capitalism is our only option. I can see many of the advantages of being part of these larger conversations, and certainly the appeal of interdisciplinary funding. But just as efforts by the IPCC have not 'led to appreciable behavioural changes', I do wonder whether new intellectual collaborations might suffer from similar issues of relevance, particularly if we do not rethink our way of working not just inside the walls of academia, but also beyond the university.

Riede does briefly suggest that the environmental humanities might encourage us to engage wider publics. Certainly, his own work in the Coast to Coast Climate Challenge project and at the lignite mining site of Søby shows the considerable value in engaging broader communities beyond academia. Did an environmental humanities framing change the narratives for the public in either context? In confining our thinking about our relevance from within (and across) disciplinary boundaries, are we missing the opportunity to conduct a truly politically engaged archaeology? For Wurst and Mrozowski (2014:214), such an archaeology requires us to articulate clearly what kind of change we want to bring about. What kind of change do we want to effect in terms of the climate crisis? Does working within the environmental humanities – or any other new subdisciplines for archaeology – help produce that agenda? This is an important question, particularly since others have suggested that instead we consider 'un-disciplining archaeology', a decolonizing project that requires not new academic con-

versations, but rather a new kind of public intellectual who is engaged with a wide range of publics (Haber 2012; Wurst in press).

The engagement of our various publics has long been a difficulty for archaeology, yet it is perhaps most apparent in the climate crisis. Riede suggests there is a consensus in Europe that climate change is occurring. In Canada and the United States, however, climate denial is still driving many policy decisions. This is most explicit in the 'post-truth' US, with the nefarious actions of the Trump administration, but is also seen in the climate contradictions of the Trudeau government, which is wielding rhetorics of social and economic transformation but still acting an awful lot like a petrostate. This means that North America is a context where academic positions on climate change are sometimes muted outside the academy. For example, in her recent retirement from her position of National Park Service (NPS) Climate Change Adaptation Coordinator for Cultural Resources, Marcy Rockman (2018) complained that she spent time and energy fighting for the 'right to exist', hindering her ability to share climate narratives with the US public.

My experience of climate discussions and heritage in Bolivia are different. Bolivia is a place where human-caused climate change is very apparent, yet where paradoxes between political rhetoric and climate action abound (Aguirre & Cooper 2010). Climate change was already impacting local rural communities when academics were debating environmental determinism in the deeper Andean past (Erickson 1999; Kolata 2000). Rapidly melting glaciers are causing particular concerns about water security. A recent report (Johansen et al. 2018) suggests that glacial meltwater provides 61 per cent of the available water supply in La Paz, but in drought years it contributes up to 85 per cent. Yet current predictions see the loss of almost all Bolivian rock glaciers by 2099, a change that will impact all (as seen in the water shortages of 2016), but particularly the urban and rural indigenous poor.

This report argues for governments to engage these same vulnerable indigenous populations for their knowledge systems as a source of information. Clearly anthropologists and archaeologists who have worked within such communities for generations have a role to play here. But this Traditional Ecological Knowledge (TEK) position is rather limited, particularly in face of the climate crisis. Our work in non-western settings challenges so many of our taken-for-granteds, whether it be progressive tropes of evolution and capitalism, or the common-sense nature:culture dichotomy. Archaeologists must develop our ontological politics to challenge established forms of thinking, including those related to climate processes and political ecologies (Harrison 2016:172). We might consider one of the main takeaways from Richer and Geary's work (2017, cited by Riede), specifically that

a plurality of knowledges around landscape change are productive, but in particular those that come from outside academia.

Here I am reminded of Julie Cruickshank's (2005) work on the history of surging glaciers in the Yukon. Cruikshank explores late eighteenth-century encounters between Tlíngit and French naturalists on the Pacific North West during the development of the geological sciences. It is a story of distinct ways of ecological knowing inter-digitating around particular kinds of narratives and material traces. In her work with Yukon elders, she shows how anthropologists can map the intersections between global and local knowledge, a role in which archaeologists are equally adept (Nicholas & Markey 2015). Cruikshank ends her book with a consideration of the human history emerging from melting glaciers and shares her interlocutor's view that we need to 'listen for different stories'. Non-disciplinary voices can transform our narratives, and in some cases 'mov[e] the home address of writing' outside the university and other established spaces (Haber 2012:62).

Riede provides an important critique of some of the emerging stories of the Anthropocene. While the concept is proving to be a critical bridge across disciplinary boundaries, Riede worries about the unintentional relegation of earlier periods to a pre-Anthropocene and pre-modern period. An engagement with a diverse public and a diverse academia also provides important perspectives for archaeologies of the Anthropocene. North American indigenous scholars are critical of the role of the Anthropocene as an interdisciplinary narrative tool (Todd 2015:244). Zoe Todd (2015, 2016) argues that not all humans are equally implicated in creating the climate crisis. Many of these groups are not invited into the intellectual or academic spaces where the futures of the Anthropocene are discussed or responses formulated. Indeed, indigenous thinkers have long engaged in both climate science and climate activism, such as Sheila Watt-Cloutier (2015), the Inuit activist nominated for the Nobel Peace Prize in 2007. Those practising indigenous ways of knowing, such as *Inuit Qaujimajatuqangit*, obviously play an important role in the 'decolonization of thought' surrounding climate change, yet these voices are often left out of the discussions. We learn much more from the juxtaposition of data-driven environmental approaches and engaging knowledges of those historically emplaced within and currently experiencing such shifts (Laidler 2006).

The issue of teaching and learning the deep past of climate brings up the issue of social transmission, an issue Riede frames in terms of 'actionable cultural information and know-how'. As scholars of learning have pointed out, ideas of the world are not passively transmitted, but rather must be brought about through particular practices, including the kinds of experiential learning associated with TEK. Will the (palaeo-) environmental humanities generate a new kind of pedagogy within universities regarding

climate change? How will this 'actionable cultural information' be developed? And will this pedagogy extend beyond the walls of academia to the various publics mentioned above?

Time is the one area of learning that is both rather abstract yet crucial to issues of climate change. Indeed, much of this keynote hinges on this issue; from the argument that the environmental humanities require a deeper sense of time, to the overlapping temporal windows of various disciplines shown in Riede's figure 1. Riede highlights the possibilities for collaboration and the 'weight' of the past on the present. Many of us spend significant time in and outside the classroom discussing the relationship between deep time, archaeological landscapes, and social process. In my undergraduate and graduate seminars, we work through the climate curves from the Quelccaya Ice Cap, the highest-resolution tropical ice core in highland Peru, which is also disappearing (Yarleque et al. 2018). We explore how such climate data can inform our understanding of socio-political and economic processes seen elsewhere in South America. Students learn to think across overlapping scales of time, from human lifetimes to longer cultural and environmental trajectories while grappling with the fragmentary archaeological and climatic data.

One area that the palaeoenvironmental humanities might contribute to is in teaching temporalities to students, to our colleagues across disciplines, and to our various publics, many of whom rarely consider the multiple scales and kinds of time implicated in climate change. In a recent op-ed to the Los Angeles Times, geologist Marcia Bjornerud (2018a) argues that most of the public are 'time illiterate'. She says we need a 'new relationship with time', a cognitive shift towards 'timefulness'. Elsewhere, Bjornerud (2018b:11) explores 'chronophobia' and a variety of forms of 'time denial' that geologists and archaeologists might help vanquish. Bjornerud provides some important examples here in terms of the shifts in thinking that might be required to engage climate pasts and presents. Archaeologists working in the environmental humanities might contribute more than geological and evolutionary directional time, but also the complexities of lived time in a range of cultural contexts and their relationship to environmental rhythms (Roddick in press). Archaeology has more to offer than the scalar perspective and uniformitarianism/catastrophism provided by geology or the *longue durée* highlighted by Riede's (palaeo) humanities perspectives. Archaeology in a variety of contexts shows the wide range of temporal ontologies (for an Andean example, see Swenson & Roddick 2018), many of which provide new threads for our climate narratives. Yet, admittedly, I struggle to bring these discussions outside of my little corner of academia.

Let me end by considering futures. Our lack of action on climate change is, at least in part, a 'time horizon problem' (Orlove 2010). For some of

our publics, the medium and distant futures appear too far away for real concern or action. The growing number of dire climate reports show that our collective crisis is rapidly approaching, yet a 'chronophobia' (here of futures) persists. This is why the title of this keynote caught my attention. But Riede doesn't really explain how the palaeoenvironmental humanities might explore 'deep futures'. What does an archaeology of deep futures look like? Riede suggests that environmental archaeologists in particular must push back against simple applications of archaeological data for nation-building projects, particularly as they are wrapped up with discourses of consumption, colonization and essentialist notions of identity. The larger, difficult question, is how might we mobilize our data for new narratives of our deep environmental futures?

I agree that 'solutions from the past do not come easily'. The problem lies not in some sort of 'material incommensurability' between the past and the future, but rather a lack of effort after modernity (when the past was viewed as 'irrelevant') to reposition the past in terms of futures (Sassaman 2012:251). There is thus value in considering climate pasts in terms of 'interventions against alternative futures' (Sassaman 2012:251), ones not wedded to current economic dependencies. Matt Reilly (in press) suggests we explicitly engage with the analytical category of futurity in our work, which highlights how the past is used to make claims of the future. Reilly argues that future-making was not and is not limited to the modern west and considering such choices (including those from ancient contexts) in terms of alternative trajectories is of immense value. We might thus consider archaeological evidence, including 'hard' environmental data championed by Riede, but also the other kinds of knowledge often left out such conversations, as critical to navigating paths into 'deep futures'. Will the paleoenvironmental humanities help develop more inclusive and complex conversations about such time horizons? I hope so – and look forward to seeing Riede's future work developing such narratives in his new position.

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# Depth and Diversity: A Reply

Felix Riede

It may sound worn but I truly appreciate the opportunity and privilege not just to present some of my thoughts in print as a *Current Swedish Archaeology* keynote paper, but to have so many colleagues whom I esteem highly – Poul Holm, Paul Lane, Britt Solli, Christina Fredengren, Julia Shaw, Andrew Roddick, thank you all – take the time to comment on them. All too rarely are academic conversations and debates taken into printed media. My reading of the comments overall is a positive one and this underlines the importance, urgency and relevance of the engagement of all variants of archaeology with the contemporary quandaries precipitated by climate change, the biodiversity crisis, environmental justice – the whole entangled and wicked package of human-environment relations. Paul Lane and Britt Solli, for instance, seem to strongly support my suggestion – citing a remarkable range of additional evidence and references – that archaeologists can be strong partners in moving science communication, for instance, from 'matters of fact' to 'matters of concern' (Stewart & Lewis 2017). While some of the commentators take issue with aspects of my perspective or rather its many lamentable omissions, I would very much like to see the collective of these comments as an expression of the lively diversity within archaeology's 'palaeo' corner of the environmental humanities. This diversity finds its concrete expression in the fact that I learned a great deal reading the comments and felt compelled to chase up numerous references cited in the comments.

This diversity also comes with drawbacks, however. No single scholar – not me, at least – can keep up with the relevant knowledge production and have qualified opinions on all dimensions of the (palaeo)environmental humanities. With this disclaimer, I do not want to absolve myself from

Centre for Environmental Humanities and Department of Archaeology and Heritage Studies, Aarhus University
Email: f.riede@cas.au.dk

any mis-readings or misrepresentations, but I do want to underscore that my paper was never intended as a comprehensive review; my predilections and experiences from attending environmental humanities conferences, interacting with environmental humanities colleagues, have all shaped my vision, have shaped my paper. Christina Fredengren charges me with neglecting, for instance, gender dimensions of environmental humanities scholarship or Derridean hauntologies and with reacting strongly – maybe too strongly – against the writings of Braidotti. She states that I miss 'the long discussions and ethics-infused scholarship within the field of Environmental Humanities which have engaged with deep time, deep pasts and futures from a much more inclusive horizon'. In a way she is quite right; there are substantial bodies of scholarship that I respect but that I also see as not entirely unproblematic. Archaeology has not played a major role in this scholarship. And much of this supposedly inclusive writing reveals what to me is a vulnerable Achilles heel of the environmental humanities, that is its occasional sliding into the more arcane reaches of the humanities where intellectual cross-references and terminologies become so opaque that, I fear at least, more people are excluded from the conversation than are included. Christina Fredengren appears to be pushing for a more radical engagement of archaeology with post-humanist intellectual currents and alternative stakeholders. In that light, I may appear as a conservative, but let me here repeat an important point easily lost in the genre of keynotes: I think that intellectual diversity is paramount and that we each should play to our strengths and the strengths of the material and evidence we wield. My strength clearly lies elsewhere than Christina Fredengren's. Her entry to the ethical dimensions of archaeological research has a different starting point compared to mine. While I may seem less concerned with the classical environmental humanities than the emerging field of geoethics (Wyss & Peppoloni 2015; Riede et al. 2016; Bohle & Marone 2019), my interest is more precisely piqued by the observation that ethical engagements are entering environmental archaeological thinking from the environmental humanities as well as from the geosciences. I *am* concerned with engaging palaeoenvironmental scientists and climate and risk modelers, whom I see as stakeholders, collaborators and potential allies in making the past more relevant in policymaking precisely because they have better-established pathways in that domain (see Jackson et al. 2018). While this may seem like a conservative orientation, I am convinced that much can yet be gained from such engagements if they are conducted under the premises of an evidential and ethical awareness that is derived from the environmental humanities *sensu lato*.

One remarkable extension of my argument is encapsulated in Julia Shaw's powerful reminder that the environment and the environmental hu-

manities are also emmeshed in important ways with religious worldviews, inclusive health and well-being. The power of her argument, which I fully accept, rests in no little part in the weight of evidence she brings to bear on the matter. Her particular evidential grounding in the rich textual and material sources of late prehistoric and historic South Asia provides a vivid canvas and rich contrast for reflections on Western notions of wellbeing, nature, the environment. The striking differences that emerge show that the world does not have to function following neoliberal rules of engagement; an important antidote to many hegemonic discourses on sustainability and resilience (see also Barrios 2016). But can such thinking be integrated into novel human-environment engagements 'at home' in Europe? Given that one of my concerns is generating greater environmental engagement and action within the academy and across the many sectors with which it intersects, I wonder whether the very same difference that gives these perspectives their reflective traction, also – together with their coupled temporal, geographic and cultural distance – weakens their translation into contemporary and specifically Western discourse.

What is rather more certain is the importance of different worldviews and religions in tackling climate change impacts and disasters locally. In relation to volcanic risk mitigation, for instance, it is argued evermore strongly that such dimensions must be considered (Chester et al. 2008, 2012; Haynes et al. 2008; Donovan 2010; Barclay et al. 2015); archaeology and heritage, as Julia Shaw and I would agree, have a role to play here in staging and framing such conversations. Andrew Roddick brings a perspective from across the Atlantic into play. He reminds us that many earlier archaeological approaches, for instance those under the auspices of political ecology, have tackled environmental issues. I could not agree more but this makes it all the more remarkable that archaeological scholarship has played so little part in the new wave of the environmental humanities which – while perhaps to a degree being new imperial clothes – have also generated substantial and fresh public appeal, funding traction, and intellectual creativity. I would still maintain that archaeology has a greater role to play in this movement.

Andrew Roddick also argues that empirical robusticity is essential, especially in post-truth times. We fully agree on the need for academics to carefully consider their motivations, their tools and goals. I could not agree more but would add that such concerns swiftly bring about difficult decisions with regard to our specific employment situations – after all, most universities do value publications significantly higher than public engagement – and our skill sets and time constraints. I believe that the archaeological record speaks clearly about the substantial causal role that the environment and environmental changes play in the fates of communities

and societies. How we best react to this, how we individually contribute remains a personal decision. Activism or politics are options but they inevitably come with a price vis-à-vis our academic engagements. Furthermore, I do not think we should underestimate the potential long-term impact of working in the academy, developing and deploying novel pedagogies. Both Christina Fredengren and Andrew Roddick stress the importance of intergenerational justice and cultural transmission. Indeed, theories of cultural transmission suggest that teachers can be change agents. The called-for 'societal transformations' vis-à-vis changes in climate, environment, biodiversity can surely be assisted through teaching – also in archaeology (Riede et al. 2016). In turn, this teaching may contribute to situating universities as critical but also positive contributors in our Anthropocene future (cf. Wright 2017). Moving ahead into deep futures will require many incremental as well as some larger-scale societal adjustments. If we are lucky, we have a sufficient number of generations to bring these into effect through cultural transmission. Speaking of the deep past, both Poul Holm and Andrew Roddick would like to see a greater elaboration of this notion. First, archaeology can serve as an evidence-based interlocutor in relation to short-term political decisions conditioned by electoral terms. The notion of 'depth' should not be understood too literally here. After all, archaeology very much operates in the recent past as well as in the temporally deep past. The real strength of a 'palaeoenvironmental humanities' approach rests in more ready interfaces, terms of reference and inclusive language between the palaeoenvironmental and palaeosocietal datasets; it also brings to this transdisciplinary table a temporally deep awareness, that even when shallow time frames are under discussion, weaves in empirical, interpretative and imaginative threads coming to us from the more distant past.

Let me provide one example by returning to volcanic and attendant hazards. Here, deeper time perspectives have, for instance, shown that the relative quiet of the last century has created an illusory 'disaster gap' (Pfister 2009) leading to policy complacency (Sparks 2007) in spite of the evident risks that major eruptions – sure to happen sooner or later – would have on contemporary society (Newhall et al. 2018; Self 2006; Papale & Marzocchi 2019), especially under conditions of dense, urban agglomerations (Scandone et al. 2015). Such threats generate existential risks that need facing (Torres 2018; Rees 2013), but where the lived experiences of the recent past patently fail to provide adequate resources. Archaeological datasets can contribute to shaping scenarios used in preparing for such events (Sonnek et al. 2017; Schmidt et al. 2011; Riede 2017), and they can also feed into exercises of empirically disciplined speculation where the genres of science-based scenario-building and climate fiction meet. Archaeology

can assist in long-term risk communication, in 'imagining the unimaginable' (Donovan & Oppenheimer 2018:149) – the deep and deeply entangled futures of changed climates, changed environments and changed societies.

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