UDK: 902/904:5/6
113/119
Originalni naučni rad

https://doi.org/10.21301/eap.v16i3.2

Ivana Živaljević

BioSense Institute, University of Novi Sad, Serbia
ivana.zivaljevic@biosense.rs

Multispecies Pasts and the Possibilities of Multispecies Futures in the Age of the Anthropocene*

Abstract: The Anthropocene emerges as an aftermath of the long-held, pervasive belief in human exceptionalism, and a wake-up call to reconsider our being in the world as entangled with a plethora of other living selves. Along with ecological and social challenges facing all life on Earth, the very boundaries between Nature and Culture, biological and social, human and nonhuman are being destabilized. From an archaeological perspective, particularly relevant is the understanding of diachronic change through shifting webs of interspecies relations (sensu Tsing). By engaging with various strands of thought within archaeology, anthropology, ecology and ethology, this paper aims to offer a more inclusive, multispecies view of the past. Ultimately, a consideration of human and nonhuman histories as entangled, bears important implications for multispecies futures.

Keywords: Anthropocene, Nature–Culture, assemblages, ontological turn, relational ontologies, multispecies pasts

Introduction

With the dramatic anthropogenic imprint on all Earth's ecosystems (greenhouse gas emissions, global warming, soil and water contamination, mass extinction and habitat destruction, the exponential growth of human population), the concept of the "Anthropocene" is rapidly gaining traction. Originally proposed as a new geological epoch by the atmospheric chemist Paul Crutzen and limnologist Eugene Stoermer (Crutzen and Stoermer 2000; Crutzen 2002), the term has since become a major part of the conversation well beyond the domain of geosciences and climatology. Along with entering the public sphere, the ecological and social challenges facing all life on Earth were also a call to "unsettle the humanities",

* I acknowledge the financial support of the Ministry of Education, Science and Technological Development of the Republic of Serbia (Grant No. 451-03–9/2021–14/200358). I thank the editors for inviting me to contribute to this volume, as well as Sonja Žakula, Monika Milosavljević, Uroš Matić and Vladimir Jovanović for all the stimulating discussions on the subject.

historically concerned with the cultural part of the Nature–Culture dichotomy (Bird Rose et al. 2012). As Bruno Latour (1993, 2004) has argued, this crisis cannot be addressed from within analytical frameworks inherited from sciences or humanities, as the disciplinary divide itself has been built upon the strict separation of the human from the nonhuman. The growing, interdisciplinary area of environmental humanities, drawing from environmental philosophy and anthropology, political ecology, posthuman geographies, animal studies, postcolonial criticism and ecocriticism, emerges as a radical break with these very pillars of modernist thought (Bird Rose et al. 2012; Emmet and Nye 2017). In line with recent approaches to the biological, technological and social as shifting networks of relationships (Latour 1993, 2005; Haraway 2003, 2008), and anthropological engagements with alternate, Indigenous ways of being in the world (Viveiros de Castro 1998; Kohn 2007; Descola 2013), these novel perspectives can be associated with the post-Cartesian "ontological turn" (cf. Viveiros de Castro 2015; Holbraad and Pedersen 2017). Namely, environmental humanities aim to take both humans, nonhumans, and various features of the material world seriously, not as autonomous and self-sustaining entities, but as "meshworks" (cf. Ingold 2011) and dynamic assemblages (Edgeworth 2016). It is a consideration of how we, as humans, become "entangled with other kinds of living selves" (Kohn 2007, 4), or how we "become with" (Haraway 2008). When observed through this lens, the Anthropocene becomes less about the dominance of the humankind, and more about its extreme fragility and entanglement.

With its Deep Time perspective on human–environmental relations, materiality and agency, archaeology occupies a unique position to join in the conversation. The onsets of anthropogenic processes that are transforming the Earth have been recognized throughout the Holocene, and even in the Pleistocene. However, archaeology's insight and contribution is hardly exhausted with the question of *when*. It is precisely the archaeological record that preserves material traces of coexistence, predation, extinction, commensalism, partnership, companionship, mutual becomings – the changing webs of relations with a myriad of different creatures humans entangled themselves in. By engaging with various strands of thought within archaeology, anthropology, ecology and ethology, this paper aims to offer a more inclusive view of the past – that is, of multispecies pasts.

Archaeology and the Anthropocene: beginnings, effects and assemblages

Archaeologists have been quick to engage in the Anthropocene debate, namely in issues regarding the onset and development of human ecological imprints on a local, regional, and global scale. One of the major concerns was to

establish the temporal boundary between the Holocene and the Anthropocene – the former representing a well established epoch, in which we thought we lived until recently (Edgeworth 2014, 76), and the latter still not precisely defined (at least not by existing geological standards), but rather a "lived reality" (cf. Crate and Nuttall 2009, 9).

As opposed to initial propositions to equate the beginnings of the Anthropocene with the dawn of the Industrial Revolution in the latter part of the 18th century (Crutzen and Stoermer 2000; Crutzen 2002), and later arguments in favour of the "Great Acceleration" of energy use from the mid-20th century (Zalasiewicz et al. 2015; Waters et al. 2016), many archaeologists and other scholars emphasized that these processes have had a much longer history. Late Pleistocene megafaunal extinctions, Early Holocene human niche construction, animal and plant domestication and the subsequent spread of agriculture, human impact on marine fisheries and ecosystems, urbanization and colonialism have all been cited as anthropogenic phenomena with long-term ecological consequences (Ruddiman 2003; Erlandson and Braje 2013; Smith and Zeder 2013; Braje et al. 2014). Ultimately, Smith and Zeder (2013) proposed that the Anthropocene can be considered as coeval with the Holocene as a whole. The debate on origins was also subjected to criticism; e.g. Graves-Brown (2014) argued that the principal role of archaeology should be to deconstruct temporal and spatial frontiers, rather than impose them. On the other hand, Crossland (2014, 125), pointed out that any attempt to embed the onset of the Anthropocene deep into the past and in other (Non-Western) parts of the world is to "spread its genesis, and the responsibility for it, across many different human societies". Both projects – to understand the dynamics of change and to locate agency – are worthy of consideration here. Human beings have always been entangled in material worlds they inhabited, and a quest for a "pre-human impact baseline" (Lane 2015, 5) echoes former dualist and social-evolutionary narratives which have long populated the past with "noble savages" and "natural", pristine landscapes. Nonetheless, as many millennia of human existence on Earth show, the Anthropocene is not an inevitable condition, but rather a specific turn these entaglements took. There is little doubt that particular ontological attitudes and practices associated with the Western civilization – anthropocentrism, capitalism and consumerism – lie at the root of the current planetary crisis.

Consequently, other authors were more concerned with the political and social dimensions of the Anthropocene, emphasizing that archaeology amid climate change should not restrict itself to paleoenvironmental insights (however valuable they may be), without considering the effects of colonialism, inequality, and the uneven rate of consumption, exposure to threats, and access to resources across the globe (Lane 2015; see Crate and Nuttall 2009 for similar perspectives in anthropology). The humankind is obviously not homogenous; the

Anthropocene also brings stories of human insignificance when the adversary is profit, and some of "us" have been considered "more disposable than others" (Gan et al. 2017, G4). There have also been calls for a more engaged, public archaeology – as a medium to raise awareness of social justice and environmental issues (collapse, resilience, sustainability), and as a useful tool for rethinking the relationship between the natural and the artificial in the processes of artefact production, use and discard (Hudson et al. 2012).

A recent turn in archaeology as a "discipline of things" (Olsen et al. 2012) proved to be particularly well suited to engage with the material realities of the Anthropocene (Lane 2015; Pétursdóttir 2017, 2018), or with "future pasts" (Campbell 2021) at both planetary and extra-planetary scale (Gorman 2014). Regardless of its name, there is a tangible quality to the Anthropocene that can indeed be characterized as posthuman. As Pétursdóttir (2017, 182) notes in her discussion of marine debris, "the problem is not that things become buried deep in strata but that they endure, outlive us, and come back with a force we didn't realize they had". The persistence of plastics, greenhouse gasses, radio waves and nuclear radiation constitutes what has been identified as a human-generated, but more-than-human hyperobject (Morton 2013). Plastics for example have a way of constituting new assemblages, moving from the sphere of use to the environment and to living organisms, as many devastating images from aquatic ecosystems show. In a recent study, Ragusa et al. (2021) detected smaller particles derived from the degradation of plastic objects (microplastics) in the very tissue of human bodies, in maternal and foetal placenta. The principal author described it as "it is like having a cyborg baby: no longer composed only of human cells, but a mixture of biological and inorganic entities" (Ragusa n.d., quoted in Carrington 2020). Ultimately, Pétursdóttir (2018, 100) argues that the environment, as conceptualized in archaeology, "must not be a web of harmonious, symmetrical relations between a multitude of species, between nature and culture, humanity and environ, but rather full of asymmetry, full of darkness, and full of regions devoid of human presence".

However, it is the relations between species and environs I wish to turn to here, asymmetrical, messy and lively as they come. While decentering the human and recognizing that objects have agency, archaeologists have often failed to do the same in case of sentient, living, nonhuman beings (Overton and Hamilakis 2013, 114). It is these "myriads of other critters" (Haraway 2015, 161) we share the planet with, along with all the challenges and grim prospects set in motion by human exceptionalism. Perhaps the most poignant portrayal of the Holocene-Anthropocene distinction was offered by Anna Tsing, who suggested that the Holocene was a long period when refugia for various species still existed to "sustain reworlding". The turning point towards the Anthropocene occurs when refugia get wiped out beyond retrieval (Tsing 2015a, quoted in Haraway

2015, 159–160). Moreover, extinction is never about the loss of particular species, but of whole ecological assemblages – a "multispecies event" (Gan et al. 2017, G4). As shown by various authors concerned with multispecies assemblages, plants dwindle when their animal seed dispersers become endangered or extinct (Gan et al. 2017; Bird Rose 2017; Svenning 2017), the shifts from rich ecological diversity to monoculture crop plantations have a shared history with slavery (Tsing 2012), cutting down trees increases the temperature in urban areas, extinctions leave material traces. Tsing (2012, 144) employs these shifting "webs of interspecies dependence" to refer to human nature itself as an "interspecies relationship". In a similar vein, Donna Haraway (2015, 159) argues that "no species, not even our own arrogant one pretending to be good individuals in so-called modern Western scripts, acts alone; assemblages of organic species and abiotic actors make history". In other words, assemblages have both history and materiality, two important qualities which place archaeology – or what can be identified as "multispecies archaeology" (Pilaar Birch 2018) – in a unique position to assemble with other environmental humanities.

From human to multispecies pasts

The "multispecies" concept may have entered the humanistic discourse fairly recently, but has long been part of biological and ecological research, referring to various ways species coexist and interact in the environment. In an anthropological context, Eben Kirksey and Stefan Helmreich have first utilized it to include "creatures previously appearing on the margins" of the discipline as economic and symbolic resources, and explore "how a multitude of organisms' livelihoods shape and are shaped by political, economic, and cultural forces" (Kirksey and Helmreich 2010, 546). Their "multispecies ethnography" aligns with Eduardo Kohn's (2007) project to transcend the human and situate life – *all* life – as the relevant context of anthropological inquiry. Drawing from biosemiotics and his ethnographic work in the Upper Amazon, Kohn (2007, 2013) argued that the ability to represent, produce and interpret signs is inherent to all living beings, which allows the Amazonian Runa people to form communicative relationships with their dogs, various forest dwellers, and the forests themselves. Viverios de Castro (1998) previously introduced the concept of "multinaturism" or "Amerindian perspectivism" to designate worlds inhabited by various persons, human and nonhuman, each with a distinctive point of view. Beyond these alternative, or relational ontologies as they came to be known, other anthropologists also became curious about a plethora of living selves. The last two decades have witnessed a proliferation of studies, immersed in anthropological, ecological and ethological dialogue, from meerkats treating biologists as a part of the landscape

(Candea 2010), the effects of settler colonialism on symbiotic love between flowering eucalyptus trees and flying foxes (Bird Rose 2017), to mushrooms growing amid radioactive waste (Tsing 2015b).

When it comes to archaeology, how are we to engage with multispecies, more-than-human pasts? Archaeozoology, archaeobotany, and the application of various biomolecular approaches (ancient DNA, stable isotopes, lipids) – also known as the "Third Science Revolution" (Kristiansen 2014) – have already populated archaeological research worlds with animals, plants, fungi, parasites and microbes. Various organisms which once inhabited the Earth can be identified not only on the basis of their physical remains (bones, shells, seeds) but also in the environment, encapsulated in soils, substances and materials (e.g. Rawlence et al. 2014; Roffet-Salque et al. 2017; Rosengren et al. 2021). A noteworthy example comes from southern Denmark, where a complete human genome, plant and animal DNA (presumably from a meal), and DNA fragments from commensal mouth microbes were sequenced from a piece of birch pitch, chewed by a woman who lived c. 5700 years ago (Jensen et al. 2019). Coprolites and soils from latrines, cesspits and burials from areas which were once the Roman Empire revealed the presence of intestinal parasites, spreading throughout the Roman(ized) world along with multi-seat public toilets, sewer systems, fountains, aqueducts, and a taste for fermented fish sauce (Mitchell 2017). Such occurrences evoke the way Haraway (2008, 31) speaks of organisms as "ecosystems of genomes, consortia, communities, partly digested dinners, mortal boundary formations", or the way Deleuze and Guattari (1987, 10) refer to their lateral, interspecies, interpersonal transfer as a rhizome which "we form... with our viruses, or rather our viruses cause us to form a rhizome with other animals".

What often remains absent in science-based archaeology, or, as Nilsson Stutz (2018) notes, may feel out of place in its discourse, are humanistic perspectives. She argues that the application of various scientific methods had a transforming effect, with archaeology shifting from a humanistic discipline engaged with asking questions, to an empirical science concerned with providing definite, unambiguous answers. Such enterprises, while important, pose a risk of creating a simplified version of the past, rather than a multifacted one (Nilsson Stutz 2018). Moreover, while the divergent paradigms in archaeology considered humans as either agentive subjects or objects of scientific inquiry (Sofaer 2006), all other species have mainly fallen under the latter category. In regard to animals in particular, Overton and Hamilakis (2013) criticized the ways archaeozoology (or zooarchaeology) had long been embedded in reductionist epistemologies, reducing animals to calories, or symbols at best. These authors proposed a new, "social zooarchaeology", which "avoids anthropocentrism; begins from a zoontology of species co-shaping; reinstates the agency of animals, both in life and in death; and appreciates the embodied and sensory nature of interspe-

cies interaction" (Overton and Hamilakis 2013, 117). Argent (2016) recognized another hindrance in the postmodern rejection of "essentialisms", emphasizing that animals, while culturally shaped and bestowed with meanings, exist and experience the world in their own ways. What she identifies as "relational zooarchaeology" should approach animals "as such", while continuing to reflect on "human and animal ways of being within larger-scale social practices in historically particular ways" (Argent 2016, 29).

Similarly to anthropologists and other environmental humanities scholars, archaeo(zoo)logists too became engaged with this "animal turn" (cf. Ritvo 2007), offering their own unique perspectives and insights. Argent (2010, 2016) explored human–horse intersubjectivities in the context of Iron Age Pazyryk, Armstrong Oma (2010) drew attention to close contact, mutual trust and social contracts between pastoralists and domestic animals, with case-studies from the Scandinavian Bronze Age, whereas Overton (2018, 2019) used examples from the British Mesolithic to demonstrate that hunter-gatherers can form meaningful relationships with wild animals by inhabiting the same environment. Plants have been catching up, too; in a recent paper, Taylor (2020) explored the ways human engagement with trees and wooden objects could have shaped Mesolithic hunter-gatherer worldviews. In 2018, a volume titled *Multispecies Archaeology* (Pilaar Birch 2018) broadened the focus even more. Starting with a question what would happen to our understanding of the past if humans were no longer centre stage, but one actor among many (Pilaar Birch 2018, 2), the volume considered all kinds of interspecies and person-thing entanglements – from animal and plant agency in the processes of domestication, multispecies ecologies of urban environments and built spaces, to the aformentioned, plastic realities of the Anthropocene. The past and present are rapidly being repopulated, with more than human actors.

Of beavers, hazelnuts, and naturecultural entanglements

The implications of a multispecies turn are manifold, both for archaeology's place within the environmental humanities project, and for the discipline itself. Namely, a shift from Nature–Culture to "Naturecultures" (cf. Haraway 2003), that is, a recognition that the biophysical and social are intrinsically entwined, offers unique (previously, close to non-existent) possibilities for intra-archaeological dialogue. Instead of "dreary", reductionist and deterministic scientific narratives, and postmodern ones where "humans do all the constructing" (cf. Noske n.d., quoted in Argent 2016, 21), multispecies archaeology paves the way to immerse our knowledge of various organisms which coexisted with humans in questions of materiality, agency, personhood, embodiment and entanglement.

Multispecies archaeology is one of co-shaping and mutual becoming; the disciplinary divide holds no more. After all, as noted by Haraway more than three decades ago, "scientific practice is above all story-telling practice", in a sense that both sciences such as biology and the humanities are inherently historical, and their discourse narrative (Haraway 1989, 4).

For example, let us consider a phenomenon ecologists refer to as trophic cascades, to explain the ways entire ecosystems change when a single element in the food chain perishes or becomes overabundant (e.g. Terborgh and Estes 2013). Trophic cascades are bona fide entanglements. Perhaps the best known example involves wolf reintroduction to the Yellowstone National Park, after they have been absent for 70 years (Ripple and Beschta 2012; see also Monbiot 2013 TED Talk whose excerpts were used in the popular documentary *How Wolves Change Rivers*). The wolves were originally reintroduced as damage control, to keep the ubiquitous deer population in check and diminish the effects of browsing, but this also set off a chain of complex cascading events. As deer changed their behavior to avoid the predatory newcomers, in many places, especially the riverbanks, tree species such as aspen, cottonwoods and willows began to regenerate. The woodlands in turn stabilize the banks, narrow river channels, and prevent erosion and meandering. Restored plant communities also attracted many other species – birds, small rodents and lagomorphs, as well as beavers that commonly build their dams and lodges from felled logs, create niches for other aquatic animals, and shape rivers in their own ways. The whole ecosystem started to transform, in a vibrant meshwork of interspecies dependence.

Such interdependences occupy an important place in the study of ecosystem stability, imbalance and mass extinctions, but they also provide something vital to our understanding of multispecies entanglements in the past. For example, many Mesolithic contexts attest to a great degree of familiarity between humans and beavers within wetland environments both species were drawn to. As Overton (2019) suggests, humans came to know beavers through face-to-face encounters, but they could also observe material changes in the landscape – lodges and dams, felled trees, stumps, elevated water levels. We may well imagine that beavers too gained their own experiences by crossing paths with humans, human built spaces, and other traces of their presence. Ultimately, these large rodents could have been recognized as familiar "Others", in many ways similar to human beings, given their building activity, the tendency to stand on hind legs when attacked, and the ability to vocalize in a diverse manner (Overton 2018, 2019). The Mesolithic cemetery of Yuzhniy Oleniy Ostrov in northwestern Russia provides a salient example of corporeal entanglements, with two individuals – a man and a woman – buried with numerous beaver teeth pendants covering their faces (Mannermaa et al. 2017). When worn, especially during movement, such decorative items would have produced distinctive rattling sounds, afford-

ing particular sensory experiences (cf. Rainio et al. 2021). Perhaps, the pendants retained some of their "beaverness" which enabled the wearer to become a part of a wider, more-than-human assemblage, as suggested by Conneller (2004) in her study of the red deer antler frontlets from Star Carr.

Both Star Carr and Thatcham V in Britain yielded beaver remains and gnawed wood specimens, with the piece from the former site modified both by beaver teeth and human hand (Overton 2019). The Thatcham V paleonvironmental record is also indicative of several clearance events (most of them anthropogenic, but one with no traces of fire use), as well as waterlogged conditions (possibly, beaver-induced) which eventually brought an end to the human occupation of the site (Chisham 2004, quoted in Overton 2019, 206, 213). Beavers, along with humans, had been busy ecosystem engineers in other places too, for instance at the Mesolithic site of Strandvägen in Sweden. Here, numerous waterways cut through and opened up the forests to sunlight, and the additional felling of trees by humans and beavers improved the conditions for the sun-loving crabapple, willow, and hazel (Carlsson 2008, 125). Mesolithic people had much love for hazelnut, insomuch that Richard Bradley famously said (and came to be widely quoted), "successful farmers have social relations with one another, while hunter-gatherers have ecological relations with hazelnuts" (Bradley 1984, 11). Nothing wrong with that, we may argue, as ecological relations *are* social relations. As previously discussed, the interrelatedness of various beings in the environment is recognized in both ecological studies and relational ontologies of contemporary hunter-gatherers. It is mainly the intersubjective, interpersonal, and inherently social character of relations in the latter which represents the point of divergence. With the growing recognition that our own concepts of the social are culturally specific, and difficult to disentangle from the "natural", it becomes obvious that mutually constitutive relationships are hardly restricted to the human arena. In the context of Mesolithic Strandvägen (and many others), humans, beavers and hazel trees co-shaped each other through continuous engagement and dwelling. The landscape itself was in a constant process of becoming, in an interplay of human and nonhuman agency.

What these exercises in "naturecultural" thinking show, is that phenomena – be they Early Holocene forest clearances, intestinal parasites thriving with Roman expansion, or microplastics showing up in placenta – are meshworks of shifting, ever-changing relationships of beings, abiotic actors, niches and forces (cf. Edgeworth 2016). At this particular point in history, intensive human action incites equally intensive responses and cascade events of planetary scale. Humans cannot isolate themselves in a separate domain, as this domain was illusory to begin with. Both hazelnut trees growing in forest clearings and Roman parasites have important stories to tell in the Anthropocene.

Conclusions

With the current rate of human-induced mass extinctions, it is estimated that the vast majority of species and ecological assemblages will be lost in the next couple of centuries, if not before (cf. Barnosky et al. 2011; Ceballos et al. 2015). In the recent volume *Arts of Living on a Damaged Planet: Ghosts and Monsters of the Anthropocene*, Gan *et al*. (2017) referred to the vestiges of past lifeways and lifeforms as "ghosts" or "haunted landscapes". Ultimately, the material traces of a number of nonhuman beings which once roamed, swam, flew and crawled the Earth, or strive to do so in the present, will be preserved in the archaeological record only.

Amid the growing feeling that it is too little too late, the widespread faunal loss has also inspired new approaches to restore ecosystem biodiversity and self-regulation through trophic rewilding (Svenning 2017). In recent years, several projects have been launched to reintroduce beaver, European bison, and feral horse to both wildlands and densely populated areas of Europe. Apart from recently extirpated species, there have also been efforts to include ecological replacements for species which perished during the Late Pleistocene and Early Holocene. Long-term ecological perspectives are of paramount importance for a "wilder Anthropocene" (Svenning 2017), and archaeologists, amid their own hardships in a profit-oriented world, came to realize their unique potential (see Albarella 2021).

But it does not end there. We need to change the narrative, tell different stories. Instead of humans mastering Nature, gaining control over animals, plants and various environments, we need to tell stories which take multispecies responses into account, stories of mutual becomings. To go back to Anna Tsing (2012) once more, we need to explore the ways humans have historically shifted along with varied webs of interspecies dependence. In order to protect and nourish "Holocene entanglements" (Gan et al. 2017, G2) in the Anthropocene, we need multispecies pasts.

Translated by the author

Literature

Albarella, Umberto. 2021. „Attacks on archaeology will harm efforts to restore the natural world". *Inkcap Journal*, August 4, 2021. https://www.inkcapjournal.co.uk/attacks-on-archaeology-will-harm-efforts-to-restore-the-natural-world/?fbclid=IwAR2T_bRp5TATor6gybhKiU-XFtMg6WpMegyXvZQjusTB0t4ZUp23O-KX5D0Y

Argent, Gala. 2010. „Do the clothes make the horse? Relationality, roles and statuses in Iron Age Inner Asia". *World Archaeology* 42 (2): 157–174. https://doi.org/10.1080/00438241003672633

Argent, Gala. 2016. „Killing (constructed) horses – interspecies elders, empathy and emotion, and the Pazyryk horse sacrifices“. In *People with Animals: Perspectives & Studies in Ethnozooarchaeology,* edited by Lee G. Broderick, 19–32. Oxford and Philadelphia: Oxbow Books.

Armstrong Oma, Kristin. 2010. „Between trust and domination: social contracts between humans and animals”. *World Archaeology* 42 (2): 175–187. https://doi.org/10.1080/00438241003672724

Barnosky, Anthony D., Nicholas Matzke, Susumu Tomiya, Guinevere O. U. Wogan, Brian Swartz, Tiago B. Quental, Charles Marshall, Jenny L. McGuire, Emily L. Lindsey, Kaitlin C. Maguire, Ben Mersey and Elizabeth A. Ferrer. 2011. „Has the Earth's sixth mass extinction already arrived?”. *Nature* 471 (7336): 51–57. https://doi.org/10.1038/nature09678

Bird Rose, Deborah. 2017. „Shimmer: When All You Love is Being Trashed”. In *Arts of Living on a Damaged Planet: Ghosts and Monsters of the Anthropocene*, edited by Anna Tsing, Heather Swanson, Elaine Gan, and Nils Bubandt, G51–G63. Minneapolis and London: University of Minnesota Press.

Bird Rose, Deborah, Thom van Dooren, Matthew Churelew, Stuart Cooke, Matthew Kearnes and Emily O'Gorman. 2012. „Thinking Through the Environment, Unsettling the Humanities”. *Environmental Humanities* 1 (1): 1–5. https://doi.org/10.1215/22011919–3609940

Bradley, Richard. 1984. *The Social Foundations of Prehistoric Britain: Themes and Variations in the Archaeology of Power*. London: Addison-Wesley Longman Limited.

Braje, Todd J., Jon M. Erlandson, C. Melvin Aikens, Tim Beach, Scott Fitzpatrick, Sara Gonzalez, Douglas J. Kennett, Patrick V. Kirch, Gyoung-Ah Lee, Kent G. Lightfoot, Sarah B. McClure, Lee M. Panich, Torben C. Rick, Anna C. Roosevelt, Tsim D. Schneider, Bruce Smith and Melinda A. Zeder. 2014. „An Anthropocene Without Archaeology – Should We Care?”. *The SAA Archaeological Record* 14 (1): 26–29.

Campbell, Peter B. 2021. „The Anthropocene, hyperobjects and the archaeology of the future past”. *Antiquity*, 1–16. https://doi.org/10.15184/aqy.2021.116

Candea, Matei. 2010. „"I fell in love with Carlos the meerkat": Engagement and detachment in human–animal relations”. *American Ethnologist* 37 (2): 241–258. https://doi.org/10.1111/j.1548–1425.2010.01253.x

Carlsson, Tom. 2008. *Where the River Bends Under the Boughs of Trees: Strandvägen – a Late Mesolithic Settlement in Eastern Middle Sweden*. Stockholm: Riksantikvarieämbetet.

Carrington, Damian. 2020. „Microplastics revealed in the placentas of unborn babies.” *The Guardian*, December 22, 2020. https://www.theguardian.com/environment/2020/dec/22/microplastics-revealed-in-placentas-unborn-babies

Ceballos, Gerardo, Paul R. Ehrlich, Anthony D. Barnosky, Andrés García, Robert M. Pringle and Todd M. Palmer. 2015. „Accelerated modern human–induced species losses: Entering the sixth mass extinction”. *Science Advances* 1 (5): e1400253. https://doi.org/10.1126/sciadv.1400253

Chisham, Catherine. 2004. *Early Mesolithic Human Activity and Environmental Change: A Case Study of the Kennet Valley*. Unpublished PhD Dissertation, University of Reading.

Conneller, Chantal. 2004. „Becoming deer. Corporeal transformations at Star Carr". *Archaeological Dialogues* 11 (1): 37–56. https://doi.org/10.1017/S1380203804001357

Crate, Susan A. and Mark Nuttall. 2009. „Introduction: Anthropology and Climate Change". In *Anthropology and Climate Change: From Encounters to Actions*, edited by Susan A. Crate and Mark Nuttall, 9–36. Walnut Creek: Left Coast Press.

Crossland, Zoe. 2014. „Anthropocene: Locating Agency, Imagining the Future". *Journal of Contemporary Archaeology* 1 (1): 123–128.

Crutzen, Paul J. 2002. „The "anthropocene"". *Journal de Physique IV* 12 (10): 1–5. https://doi.org/10.1051/jp4:20020447

Crutzen, Paul J. and Eugene F. Stoermer. 2000. „The "Anthropocene"". *IGBP Newsletter* 41: 17–18.

Deleuze, Gilles and Félix Guattari. 1987. *A Thousand Plateaus. Capitalism and Schizophrenia*. Translated by Brian Massumi. Minneapolis & London: University of Minnesota Press.

Descola, Philippe. 2013. *Beyond Nature and Culture*. Translated by Janet Lloyd. Chicago and London: The University of Chicago Press.

Edgeworth, Matt. 2014. „Archaeology of the Anthropocene: Introduction". *Journal of Contemporary Archaeology* 1 (1): 73–77.

Edgeworth, Matt. 2016. „Humans – part of dynamic assemblages (of species, niches, forces) that are changing Earth". *Social Evolution Forum*, March 14, 2016. https://evolution-institute.org/focus-article/humans-the-species-that-changed-earth/?source=sef

Emmet, Robert S. and David E. Nye. 2017. *The Environmental Humanities: A Critical Introduction*. Cambridge (MA) and London: MIT Press.

Erlandson, Jon M. and Todd J. Braje. 2013. „Archaeology and the Anthropocene". *Anthropocene* 4: 1–7. http://dx.doi.org/10.1016/j.ancene.2014.05.003

Gan, Elaine, Anna Tsing, Heather Swanson and Nils Bubandt. 2017. „Introduction: Haunted Landscapes of the Anthropocene". In *Arts of Living on a Damaged Planet: Ghosts and Monsters of the Anthropocene*, edited by Anna Tsing, Heather Swanson, Elaine Gan, and Nils Bubandt, G1–G14. Minneapolis and London: University of Minnesota Press.

Gorman, Alice. 2014. „The Anthropocene in the Solar System". *Journal of Contemporary Archaeology* 1 (1): 87–91.

Graves-Brown, Paul. 2014. „When was the Anthropocene? (and Why?)". *Journal of Contemporary Archaeology* 1 (1): 77–81.

Haraway, Donna. 1989. *Primate Visions: Gender, Race, and Nature in the World of Modern Science*. New York and London: Routledge.

Haraway, Donna. 2003. *The Companion Species Manifesto: Dogs, People, and Significant Otherness*. Chicago: Prickly Paradigm Press.

Haraway, Donna. 2008. *When Species Meet.* Minneapolis and London: University of Minnesota Press.

Haraway, Donna. 2015. „Anthropocene, Capitalocene, Plantationcene, Chthulucene: Making Kin". *Environmental Humanities* 6 (1): 159–165. https://doi.org/10.1215/22011919–3615934

Holbraad, Martin and Morten Axel Pedersen. 2017. *The Ontological Turn: An Anthropological Exposition*. Cambridge: Cambridge University Press.

Hudson, Mark J., Mami Aoyama, Kara C. Hoover and Junzō Uchiyama. 2012. „Prospects and challenges for an archaeology of global climate change". *Wiley Interdisciplinary Reviews: Climate Change* 3 (4): 313–328. https://doi.org/10.1002/wcc.174

Ingold, Tim. 2011. *Being Alive: Essays on Movement, Knowledge and Description*. New York: Routledge.

Jensen, Theis Z. T., Jonas Niemann, Katrine Højholt Iversen, Anna K. Fotakis, Shyam Gopalakrishnan, Åshild J. Vågene, Mikkel Winther Pedersen, Mikkel-Holger S. Sinding, Martin R. Ellegaard, Morten E. Allentoft, Liam T. Lanigan, Alberto J. Taurozzi, Sofie Holtsmark Nielsen, Michael W. Dee, Martin N. Mortensen, Mads C. Christensen, Søren A. Sørensen, Matthew J. Collins, M. Thomas P. Gilbert, Martin Sikora, Simon Rasmussen and Hannes Schroeder. 2019. „A 5700 year-old human genome and oral microbiome from chewed birch pitch". *Nature Communications* 10: 5520. https://doi.org/10.1038/s41467–019–13549–9

Kirksey, Eben S. and Stefan Helmreich. 2010. „The Emergence of Multispecies Ethnography". *Cultural Anthropology* 25 (4): 545–576. https://doi.org/10.1111/j.1548–1360.2010.01069.x

Kristiansen, Kristian. 2014. „Toward a New Paradigm? The Third Science Revolution and its Possible Consequences in Archaeology. *Current Swedish Archaeology* 22: 11–34. https://doi.org/10.37718/CSA.2014.01

Kohn, Eduardo. 2007. „How Dogs Dream: Amazonian Natures and the Politics of Transspecies Engagement". *American Ethnologist* 34 (1): 3–24. https://doi.org/10.1525/ae.2007.34.1.3

Kohn, Eduardo. 2013. *How Forests Think: Toward an Anthropology Beyond the Human*. Berkeley, Los Angeles and London: University of California Press.

Lane, Paul J. 2015. „Archaeology in the age of the Anthropocene: A critical assessment of its scope and societal contributions". *Journal of Field Archaeology* 40 (5): 485–498. https://doi.org/10.1179/2042458215Y.0000000022

Latour, Bruno. 1993. *We Have Never Been Modern*. Translated by Catherine Porter. Cambridge (MA): Harvard University Press.

Latour, Bruno. 2004. *Politics of Nature: How to Bring the Sciences into Democracy*. Translated by Catherine Porter. Cambridge (MA) and London: Harvard University Press.

Latour, Bruno. 2005. *Reassembling the Social: An Introduction to Actor-Network-Theory*. Oxford: Oxford University Press.

Mannermaa, Kristiina, Dimitri Gerasimov, Evgeny Girya and Mikhail V. Sablin. 2017. „Wild Boar (*Sus scrofa*) Teeth from a Female Burial in Yuzhniy Oleniy Ostrov, Northwestern Russia (c. 6200 cal BC) – Local Rarities or Transported Goods?". *Environmental Archaeology* 24 (1): 79–90. http://dx.doi.org/10.1080/14614103.2017.1393139

Mitchell, Piers D. 2017. „Human parasites in the Roman World: health consequences of conquering an empire". *Parasitology* 144 (1): 48–58. https://doi.org/10.1017/S0031182015001651

Monbiot, George. 2013. „For more wonder, rewild the world". TED Talk presented at an official TED conference, July 2013. https://www.ted.com/talks/george_monbiot_for_more_wonder_rewild_the_world

Morton, Timothy. 2013. *Hyperobjects: Philosophy and Ecology after the End of the World*. Minneapolis and London: University of Minnesota Press.

Nilsson Stutz, Liv. 2018. „A Future for Archaeology: In Defense of an Intellectually Engaged, Collaborative and Confident Archaeology". *Norwegian Archaeological Review* 51 (1–2): 48–56. https://doi.org/10.1080/00293652.2018.1544168

Olsen, Bjørnar, Michael Shanks, Timothy Webmoor and Christopher Witmore. 2012. *Archaeology: The Discipline of Things*. Berkeley, Los Angeles and London: University of California Press.

Overton, Nick J. 2018. „ Rhythm of Life. Exploring the role of daily and seasonal rhythms in the development of human-nonhuman relationships in the British Early Mesolithic". In *Multispecies Archaeology* edited by Suzanne Pilaar Birch, 295–309. London and New York: Routledge.

Overton, Nick J. 2019. „Can hunter-gatherers ever 'get to know' their prey? The role of environmental experiences and daily interactions in the formation of human-nonhuman relationships in the British Mesolithic and beyond". *Hunter Gatherer Research* 4 (2): 193–226. https://doi.org/10.3828/hgr.2018.10

Overton, Nick J. and Yannis Hamilakis. 2013. „A manifesto for a social zooarchaeology. Swans and other beings in the Mesolithic". *Archaeological Dialogues* 20 (2): 111–136. https://doi.org/10.1017/S1380203813000159

Pétursdóttir, Þora. 2017. „Climate change? Archaeology and Anthropocene". *Archaeological Dialogues* 24 (2): 175–205. https://doi.org/10.1017/S1380203817000216

Pétursdóttir, Þora. 2018. „Drift." In *Multispecies Archaeology*, edited by Suzanne Pilaar Birch, 85–101. London and New York: Routledge.

Pilaar Birch, Suzanne, ed. 2018. *Multispecies Archaeology*. London and New York: Routledge.

Ragusa, Antonio, Alessandro Svelato, Criselda Santacroce, Piera Catalano, Valentina Notarstefano, Oliana Carnevali, Fabrizio Papa, Mauro Ciro, Antonio Rongioletti, Federico Baiocco, Simonetta Draghi, Elisabetta D'Amore, Denise Rinaldo, Maria Matta and Elisabetta Giorgini. 2021. „Plasticenta: First evidence of microplastics in human placenta". *Environment International* 146: 106274. https://doi.org/10.1016/j.envint.2020.106274

Rainio, Riita, Dmitry V. Gerasimov, Evgeny Yu. Girya and Kristiina Mannermaa. 2021. „Prehistoric Pendants as Instigators of Sound and Body Movements: A Traceological Case Study from Northeastern Europe, c. 8200 cal. bp". *Cambridge Archaeological Journal* (2021): 1–22. https://doi.org/10.1017/S0959774321000275

Rawlence, Nicolas J., David J. Lowe, Jamie R. Wood, Jennifer M. Young, Jock Churchman, Yu-Tuan Huang and Alan Cooper. 2014. „Using paleoenvironmental DNA to reconstruct past environments: progress and prospects". *Journal of Quaternary Science* 29 (7): 610–626. https://doi.org/10.1002/jqs.2740

Ripple, William J. and Robert L. Beschta. 2012. „Trophic cascades in Yellowstone: The first 15 years after wolf reintroduction". *Biological Conservation* 145 (1): 205–213. https://doi.org/10.1016/j.biocon.2011.11.005

Ritvo, Harriet. 2007. „On the animal turn". *Dædalus* 136 (4): 118–122.

Roffet-Salque, Mélanie, Julie Dunne, David T. Altoft, Emmanuelle Casanova, Lucy J. E. Cramp, Jessica Smyth, Helen L. Whelton and Richard P. Evershed. 2017. „From the inside out: Upscaling organic residue analyses of archaeological ceramics". *Journal of Archaeological Science: Reports* 16: 627–640. https://doi.org/10.1016/j.jasrep.2016.04.005

Rosengren, Erika, Arina Acatrinei, Nicolae Cruceru, Marianne Dehasque, Aritina Haliuc, Edana Lord, Cristina I. Mircea, Ioana Rusu, Emilio Mármol-Sánchez, Beatrice S. Kelemen and Ioana N. Meleg. 2021. „Ancient Faunal History Revealed by Interdisciplinary Biomolecular Approaches". *Diversity* 13 (8): 370. https://doi.org/10.3390/d13080370

Ruddiman, William F. 2003. „The Anthropogenic Greenhouse Era Began Thousands of Years Ago". *Climatic Change* 61 (3): 261–293.

Smith, Bruce D. and Melinda A. Zeder. 2013. „The onset of the Anthropocene". *Anthropocene* 4: 8–13. http://dx.doi.org/10.1016/j.ancene.2013.05.001

Sofaer, Joanna R. 2006. *The Body as Material Culture: A Theoretical Osteoarchaeology*. Cambridge: Cambridge University Press.

Svenning, Jens-Christian. 2017. „Future Megafaunas: A Historical Perspective on the Potential for a Wilder Anthropocene". In *Arts of Living on a Damaged Planet: Ghosts and Monsters of the Anthropocene*, edited by Anna Tsing, Heather Swanson, Elaine Gan, and Nils Bubandt, G67–G86. Minneapolis and London: University of Minnesota Press.

Taylor, Barry. 2020. „Plants as persons: perception of the natural world in the North European Mesolithic". *Time and Mind* 13 (3): 307–330. https://doi.org/10.1080/1751696X.2020.1815292

Terborgh, John and James Estes, eds. 2013. *Trophic Cascades: Predators, Prey, and the Changing Dynamics of Nature*. Washington, Covelo and London: Island Press.

Tsing, Anna. 2012. „Unruly Edges: Mushrooms as Companion Species: For Donna Haraway". *Environmental Humanities* 1 (1): 141–154. https://doi.org/10.1215/22011919–3610012

Tsing, Anna. 2015a. „Feral Biologies". In *Inaugural Conference: Anthropological Visions of Sustainable Futures*. Organized by Marc Brightman, and Jerome Lewis. London: Centre for Anthropology of Sustainability (CAOS), University College London. February 13, 2015.

Tsing, Anna. 2015b. *The Mushroom at the End of the World: The Possibility of Life in Capitalist Ruins*. Princeton: Princeton University Press.

Viveiros de Castro, Eduardo. 1998. „Cosmological Deixis and Amerindian Perspectivism". *The Journal of the Royal Anthropological Institute* 4(3): 469–488. https://doi.org/10.2307/3034157

Viveiros de Castro, Eduardo. 2015. „Who is afraid of the ontological wolf?: Some comments on an ongoing anthropological debate". *The Cambridge Journal of Anthropology* 33 (1): 2–17. https://doi:10.3167/ca.2015.330102

Waters, Colin N., Jan Zalasiewicz, Colin Summerhayes, Anthony D. Barnosky, Clément Poirier, Agnieszka Gałuszka, Alejandro Cearreta, Matt Edgeworth, Erle C. Ellis, Mi-

chael Ellis, Catherine Jeandei, Reinhold Leinfelder, J. R. McNeill, Daniel deB. Richter, Will Steffen, James Syvitski, Davor Vidas, Michael Wagreich, Mark Williams, An Zhisheng, Jacques Grinevald, Eric Odada, Naomi Oreskes and Alexander P. Wolfe. 2016. „The Anthropocene is functionally and stratigraphically distinct from the Holocene". *Science* 351 (6269): aad2622. https://doi:10.1126/science.aad2622

Zalasiewicz, Jan, Colin N. Waters, Mark Williams, Anthony D. Barnosky, Alejandro Cearreta, Paul Crutzen, Erle Ellis, Michael A. Ellis, Ian J. Fairchild, Jacques Grinevald, Peter K. Haff, Irka Hajdas, Reinhold Leinfelder, John McNeill, Eric O. Odada, Clément Poirier, Daniel Richter, Will Steffen, Colin Summerhayes, James P. M. Syvitski, Davor Vidas, Michael Wagreich, Scott L. Wing, Alexander P. Wolfe, An Zhisheng and Naomi Oreskes. 2015. „When did the Anthropocene begin? A mid-twentieth century boundary level is stratigraphically optimal". *Quaternary International* 383: 196–203. https://doi.org/10.1016/j.quaint.2014.11.045

Ivana Živaljević
Institut Biosens, Univerzitet u Novom Sadu

Multispecijske prošlosti i mogućnosti
multispecijskih budućnosti u doba antropocena

Sa dramatičnim otiskom čovečanstva na sve ekosisteme Zemlje, koncept antropocena sve je više u žiži. Budući da su upravo ljudi vinovnici antropocena i zajedno sa ostalim živim svetom njegove žrtve, postaje jasno da se ovo pitanje ne može razmatrati samo iz perspektive geonauka i klimatologije. Arheologija je u jedinstvenoj poziciji da se u ovu raspravu uključi, imajući u vidu njenu usmerenost na procese dugog trajanja i povratne odnose između ljudi i životne sredine u dijahronijskoj perspektivi. Tako su začeci antropogenih procesa koji menjaju Zemlju dovođeni u vezu sa različitim pojavama u holocenu, pa čak i u pleistocenu. Time se, međutim, doprinos arheologije diskusiji ne završava; posebno kada se uzme u obzir veza između antropocena, kolonijalizma, kapitalizma i naročito antropocentrizma, tj. dihotomije priroda–kultura čija problematizacija upravo spada u domen arheologije i drugih društvenohumanističkih disciplina. Poslednjih decenija, skup novih pristupa poznat pod nazivom ontološki obrt ukazao je na potrebu za preispitivanjem antropocentričnih narativa koji su u korenu nastanka i razvoja mnogih akademskih disciplina, i uopšte modernog, „zapadnjačkog" viđenja sveta. Ovakvi pristupi otvorili su mogućnost promišljanja ljudskih i ne-ljudskih subjekata izvan modernističkih binarnih opozicija, i materijalnih svetova koji nastaju kroz međusobno konstitutivne veze. Kako ističe Dona Haravej (Donna Haraway), istoriju ne stvara jedna vrsta (pa čak ni naša), već asemblaži organskih bića i abiotskih aktera. Ontološki obrt na specifičan način premošćava jaz između prirodnih nauka i društvenohumanističkih

disciplina, koji je upravo posledica viđenja ljudi kao izdvojenih u odnosu na ostatak živog sveta. Na primer, isprepletanost svih bića u ekosistemu prepoznata je kako u ekološkim studijama, tako i u relacionim ontologijama savremenih lovačko-sakupljačkih zajednica. Razlika je u tome što se u okviru ovih drugih svi odnosi – a ne samo međuljudski – tretiraju kao društveni odnosi. A arheološki zapis nudi jedinstven uvid u materijalne tragove različitih vidova koegzistencije i promenljive mreže povezanosti sa mnoštvom drugih vrsta u koje su ljudi upleteni. Koristeći perspektivu arheologije, antropologije, ekologije i etologije, ovaj rad nastoji da pruži inkluzivniju sliku prošlosti, tj. različitih multispecijskih prošlosti. Ujedno, decentriranje ljudskog i pomeranje fokusa na zajedničke istorije oblikovanja postavlja osnovu za promišljanje mogućih načina za očuvanje multispecijskih asemblaža i u budućnosti.

Ključne reči: antropocen, priroda–kultura, asemblaži, ontološki obrt, relacione ontologije, multispecijske prošlosti

Passés multi-espèces et possibilités des avenirs multi-espèces dans la période de l'anthropocène

L'humanité laissant une empreinte dramatique sur tous les écosystèmes de la Terre, on est focalisé de plus en plus sur le concept d'anthropocène. Etant donné que ce sont exactement les humains qui sont coupables d'anthropocène et qu'ils sont ses victimes ensemble avec le reste du monde vivant, il est clair que cette question ne puisse pas être étudiée uniquement de la perspective des sciences géologiques et de la climatologie. L'archéologie se trouve dans la position exclusive de s'engager dans ce débat, ayant en vue son orientation vers les processus de longue durée et des relations réciproques entre les gens et l'environnement dans la perspective diachronique. Ainsi, l'origine des processus anthropogéniques qui changent la Terre était associée aux différents phénomènes dans l'holocène, même dans le pléistocène. Pourtant, cela ne met pas fin à l'apport d'archéologie à ce débat surtout si on prend en considération la relation entre l'anthropocène, le colonialisme, le capitalisme et surtout l'anthropocentrisme, c'est-à-dire la dichotomie nature-culture dont la problématisation appartient au domaine d'archéologie et d'autres disciplines sociales et humaines. Ces dernières décennies, l'ensemble de nouvelles approches connu sous le nom de « tournant ontologique » a souligné le besoin de reconsidérer les récits anthropocentriques se trouvant à l'origine de la création et du développement de nombreuses disciplines académiques et, en général, de la manière moderne, « occidentale » de voir le monde. Ces approches ont ouvert les possibilités de considérer des sujets humains et non-humains hors opposition binaires modernistes et des mondes matériaux apparaissant à travers des relations mutuellement

constitutives. Comme le souligne Donna Haraway, l'histoire n'est pas créée par une espèce (même pas la nôtre), mais par les assemblages des êtres organiques et des acteurs abiotiques. Le tournant ontologique comble le fossé entre les sciences naturelles et les disciplines sociales et humaines d'une manière spécifique, lui-même étant exactement la conséquence de la manière de voir les gens isolés du reste du monde vivant. Par exemple, l'entrelacement de tous les êtres dans l'écosystème est reconnu dans les études écologiques ainsi que dans les ontologies relationnelles des communautés des chasseurs-cueilleurs modernes. La différence c'est que dans ces dernières toutes les relations – et non seulement les relations interpersonnelles – sont traitées en tant que relations sociales. L'enregistrement archéologique donne un aperçu unique des traces matérielles de différentes formes de coexistence et des réseaux changeables de connexion avec une myriade d'autres espèces dans lesquelles les gens sont mêlés. En utilisant les perspectives archéologique, anthropologique, écologique et éthologique, ce travail tâche de donner une image plus inclusive du passé, c'est-à-dire des passés multi-espèces différents. En même temps, le décentrage d'humain et le déplacement d'intérêt aux histoires mutuelles de formation pose le fondement de réflexion sur les manières possibles de préserver les assemblages multi-espèces dans l'avenir.

Mots-clés: Anthropocène, Nature-Culture, assemblages, tournant ontologique, ontologies relationnelles, passés multi-espèces

Primljeno / Received: 23. 08. 2021.
Prihvaćeno / Accepted for publication: 30. 08. 2021.