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Animal Futurity: An Introduction to the Special Issue

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ABSTRACT

In order to contextualise the Animal Futurity special issue, this introduction will examine some of the ways in which humans have historically (and continuing to the present day) been enmeshed with the lives of non-human animals (NHAs), setting the stage for why alternative imaginaries for human-NHA relations are urgently necessary. This contextualisation highlights the tension between human reliance on (and relationships with) NHAs and their increasing invisibilisation. It puts pressure on the ways in which NHAs are compromised by their implication in global capital markets, and opens up avenues for the discussions of ethical consideration and care that are carried through into the articles themselves. The introduction will then conclude by offering a roadmap of the articles in the issue.

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In her book, *Animal Alterity: Science Fiction and the Question of the Animal*, Sherryl Vint explains that we are as dependent in the 21st century on animal labour as we were in the 17th. Yet, she writes,

> the use of animals in contemporary society is increasingly invisible: they are hidden away in laboratories and factory farms; slaughtered at mass disassembly plants and transformed into sanitized packages of meat; visible in mediated forms on Animal Planet or National Geographic television, but purged from city geographies (Vint 2010, 1).

The relative invisibility of the non-human animal (henceforth NHA) on the global stage implies unimportance, but this is a fallacy; like the offshoring of oil processes, this invisibility is often calculated, and subsists only at a superficial level. Packing away NHAs into controlled animal agriculture operations may allow for a politics of ignorance (McHugh 2007), but it does not make for either a just food system or an elimination of NHA suffering. Just as oil permeates our daily lives, so do NHAs and their derivative 'products'. Alongside the more easily recognisable meat, dairy, eggs, leather, and down, NHA-derived ingredients can be found in everything from cosmetics and medications to plastic bags, LCD screens, white sugar, and even cement. This is not even to mention the role that living NHAs play in human lives, from pets to pests and everything in between. As the future of humankind becomes increasingly fraught, what will happen to these NHAs with whom our lives are so deeply intertwined?

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This special issue on Animal Futurity seeks to address this question from an interdisciplinary perspective. The articles assembled here come from a variety of disciplines, examining topics ranging from rogue taxidermy to gene-editing, from videogames to Indigenous care practices. What unites them is a focus on how human relationships with NHAs are imagined, mediated, and constructed *now*, and, importantly, what that could mean for the *future* of human-NHA relations. In the face of anthropogenic climate change and ecological destruction, an alternative way of living with and alongside our terrestrial and aquatic kin is necessary.[1] Many of the articles in this issue reference the fact that the ontological and epistemological separation of humans and NHAs is grounded in colonial legacies that have sought to control and have dominion over 'nature' in order to 'put it to work'. The intellectual project that accompanied these colonial efforts – and that continues alongside unceasing capitalistic expansion – necessarily hierarchises and divides, thus erasing the reality of the deep interrelations that all members (human and nonhuman alike) of an ecosystem share with one another. In focusing specifically on animal *futurity* in this issue, we have taken a cue from science fiction and utopian studies, asking our participants to envision how current and emergent ideologies, technologies, and practices could be extrapolated to alternative futures. The authors in turn have focused on a variety of social, scientific, and political phenomena to explore whether more just futures are possible, and what practices in the present could help facilitate – or hinder – them. Only some of the articles in this issue are explicitly decolonial; nevertheless, the implicit impetus behind the project, in our minds, is a decolonial one. It is to bring to the fore the ways in which certain human relationships with NHAs – ones informed by settler-colonial and capitalist networks of power and privilege – are unsustainable, and how those relationships can act as a bellwether for the unsustainability of entire socio-politcal systems.

While the articles in the issue focus on specific moments in specific cultural contexts, they all serve as a reminder that the future of the nonhuman *is* the future of the human. In order to contextualise the special issue, this introduction will examine some of the ways in which humans have historically (and continuing to the present day) been enmeshed with the lives of NHAs, setting the stage for why alternative imaginaries for human-NHA relations are urgently necessary. This contextualisation highlights the tension between human reliance on (and relationships with) NHAs and their increasing invisibilisation. It puts pressure on the ways in which NHAs are compromised by their implication in global capital markets, and opens up avenues for the discussions of ethical consideration and care that are carried through into the articles themselves. The introduction will then conclude by offering a roadmap of the articles in the issue.

As argued by Ursula Heise (2016) and Teresa DeLoughrey (2019), among many others, humans are inextricable from a network of interspecies entanglements. Humans rely on NHAs for food, for research, for innovation and inspiration, for companionship, for entertainment, and more, but NHAs are also disappearing. Between 1970 and 2014, the planet lost 60% of its biodiversity (Living Planet Report 2018). We are in the midst of a Sixth Extinction which will affect the planet profoundly in ways we cannot yet imagine, and which we are already, in many cases, too late to change (Wake and Vredenburg 2008; Barnosky et al 2011; Kolbert 2014). Nevertheless, our intertwined relations with NHAs are often obscured in discourse about pressing sociopolitical, economic, and environmental

issues, like climate crisis. Take, for example, the ongoing debate about the Anthropocene, a term which has become one of the most frequent buzzwords in daily and academic discourse, sparking cross-, inter-, and intra-disciplinary debates across the sciences, social sciences, and the humanities. Donna Haraway et al explain,

> Love it or hate it, the Anthropocene is emerging as an inescapable word for (and of) the current moment. Popularised by Eugene Stoermer and Paul Crutzen, Anthropocene names an age in which human industry has come to equal or even surpass the processes of geology, and in which humans in their attempt to conquer nature have inadvertently become a major force in its destruction (2016, 535).

One of the greatest criticisms of this term is its linguistic homogenisation of all of humanity, obscuring the fact that not all people have (now, and have had in the past) the same impact on the environment, and that not all people have experienced and are currently experiencing the consequences of our climate crisis to the same extent. Theorists have proposed various terms, including the Capitalocene and the Plantationocene, as alternatives for the Anthropocene, each highlighting a different focal point for 'thinking through what it means for humans to have become a geological force' (Bould 2021, 9; see ibid 7–8 for a longer, though not exhaustive, list of terms). Criticisms like these are crucial, as they centre the role that legacies of colonialism and extractive practice have (and have had) in exacerbating climate change, as well as the continuing detrimental effects to our planet that stem from a capitalist world-system. Importantly, some of these re-conceptualisations of the Anthropocene (e.g. the Chthulucene; the Carnocene; the Planthropocene) have highlighted the absence of NHAs and other extra-human species in conceptualisations of the current epoch. As Ursula Heise argues, '[t]he idea of a geological era marked above all by humans not only underemphasises dimensions of nature that continue to be outside of humans' influence, from earthquakes to sunlight (cf. Clark), but also the continuous shaping and reshaping of human bodies, minds, and collectives by ecological processes and inter-species relations' (Heise 2017, 4). These theoretical approaches acknowledge NHAs not merely through statistics about greenhouse gas emissions, but instead grapple with the ways in which the human and nonhuman worlds shape and are shaped by each other – and are in fact not two distinct spheres at all, but rather an interconnected mesh (see Morton 2010). Indeed, even some of those re-conceptualisations that do not reference NHAs directly still indirectly highlight humans' entanglement with them, for example through the exploitation of NHAs for labour and the reduction of their habitats in the search for ever more commodity frontiers in the Plantationocene. For this reason, this special issue aims to create a space to consider not only anthropogenic impacts on and ways in which we articulate our relations to NHAs – including through the arts and literature as Daisy Reid's and Miranda Niittynen's articles explore – but also the crucial importance NHAs have had themselves in our lives, such as in the development of Indigenous practices, as investigated in Paz Saavendra's article.

Promoting frameworks that render visible the nonhuman world is crucial, particularly as humans struggle to find solutions to planetary crisis. Without these frameworks, humans risk exacerbating the same problems we are trying to resolve, or even creating new ones. Indeed, while we attempt to lower carbon emissions, some of the solutions proposed to tackle these issues risk imperilling extra-human species even further. One

such solution is deep-sea mining. In June 2021, the president of the Pacific island-nation Nauru, Lionel Aingimea, backed by the Canadian firm The Metals Company, notified the International Seabed Authority of their intention to begin mining the seabed in two years (Watts 2021).Mining the deep-sea could provide a source of key metals necessary for electric car batteries and other 'green' technologies, and proponents of this practice argue for the need for these minerals to combat global warming. They argue that deep-sea mining is more sustainable and less destructive than land mining, both in terms of human rights and ecological impacts, while also noting the urgency of the necessity to transition to a decarbonised automotive industry. However, many other stakeholders have noted the significantly underdetermined risk of seabed extractivism: the likelihood of destroying much marine biodiversity, which could endanger our ecosystem. The seabed is a space that scientists still do not completely know; it has not been fully mapped and explored given the cost and environmental impact of such exploration. This means that many marine species are yet to be discovered, particularly those living near hydrothermal vents where mining would take place. The ripple effects of deep-sea mining on marine biodiversity are currently unquantifiable, and therefore easier to leave out of a calculus of risk. Dangers such as releasing sedimented carbon in the sea and exacerbating ocean acidification and global warming are, however, being incorporating into a regulatory framework that as of 2022 is still being drafted. These issues become further complicated by the fact that organisms found in the deep-sea have played a central role in the development of medicines, such as the COVID-19 vaccines (Hugus 2020). Our entanglements with marine life, often forgotten through the Western tendency towards terrestrial thinking, are significant; the ocean plays a role in climate regulation and the fact that at least 50% of the world's oxygen is produced by it (NOAA 2021) means that we literally could not survive without it.

Underwater and terrestrial NHAs thus have a profound influence on the human world. They are deeply implicated in a variety of pressing issues like climate change and global health. With the COVID19 crisis – which in its early stages was popularly attributed to the consumption of a bat in Wuhan, China – raging on, zoonotic illnesses are perhaps most visible in the present moment. While at the start of the pandemic many viewed COVID19 as a once-in-a-lifetime event, pandemic outbreak risk is only increasing, with researchers noting that a confluence of agricultural intensification, human impact on the environment including climate change, and animal reservoirs of disease were significant factors in the potential for new outbreaks (Marani et al. 2021; Jones et al. 2013; Gibb et al. 2020). A 2021 NPR broadcast – drawing on a study led by Suresh Kuchipudi – for example argued that the explosion of COVID19 in the white-tailed deer population in the US could 'dash any hopes of eliminating or eradicating the virus in the U.S. – and therefore from the world' (Doucleff 2021). The transmission of avian and swine flus, such as the 1997 H5N1 outbreak in Hong Kong or the 2009 H1N1 pandemic, have been exacerbated by the crowded conditions in industrialised animal agriculture (Saenz, Hethcote, and Gray 2006). As Gray et al explain,

> Fifty years ago a US farmer might be exposed to his small herd of pigs or small flock of chickens for several minutes each day but today's agricultural workers may be exposed to thousands of pigs or tens of thousands of chickens for more than 8 hours each day. These intense and prolonged exposures provide much greater opportunity for man to serve as a bridging population in the cross-species sharing of viruses (2007, 3).

Cross-species infections go both ways, with humans introducing viruses to NHAs and vice versa, leading to the generation of new viruses. As recently as June 2020, a new strain of flu (G4EAH1N1) with 'pandemic potential' originating from the swine industry has been identified in China (Roberts 2020). The future of human health, then, is necessarily intertwined with the future of NHAs, and, in particular, with the organisation of our food system.

The transmission of these kinds of illnesses are only part of industrialised agriculture's impact, which, alongside the immense cruelty to the NHAs in its supply chain, includes both increased antibiotic resistance in humans and significant greenhouse gas emissions (Witte 1998; Gerber et al. 2013; Goodland and Anhang 2009). Animal agriculture also affects wild animal populations, for example through the industry's impact on biodiversity loss ('Livestock's Long Shadow' 2006, 181–215). A consideration of the food system is therefore essential in any consideration of animal futurity. In this issue, Sonja Ganseforth's article addresses this through her focus on the shifting meaning of fish in Japanese coastal communities. Human land use more generally has also affected wild animal populations, not only through the reduction of their natural habitats, but also through tangential effects, such as the effects of light pollution on wildlife ecosystems, including species-specific adaptations such as navigation (Dunn 2021). Activists and scholars like Nick Dunn therefore call for urban design that accounts for more-than-human futures. Symbiotic relationships between humans and NHAs have the potential to solve some of the thorny problems of environmental crisis, such as the use of grazing goats to help restore soil and mitigate the risk of megafires in the American West (Murphy Marcos 2021) or the Oyster-tecture project in Brooklyn, NY (originally commissioned by the Museum of Modern Art in 2009) that aims to use oysters, mussels, and eelgrass to filter harbour water (Oyster-Tecture n.d.). In the literary sphere, a similar impetus for imagining multispecies futures has led to works like the *Multispecies Cities: Solarpunk Urban Futures* (Rupprecht et al. 2021). As readers of *Green Letters* will already know, literature is an extremely fertile place for exploring human-NHA relations, and in this volume is represented by Daisy Reid's work on Yōko Tawada's *Memoirs of a Polar Bear* (transl. 2016).

On the other side of the coin, NHAs have historically been used as test subjects for a range of human applications, including not only disease prevention and vaccines, but also consumer goods such as cosmetics. These efforts include the infamous glow-in-the-dark rabbits, which were transgenically altered using jellyfish DNA (Holpuch 2013). Experimentation on NHAs continues to be a controversial topic. Their use as test subjects undergirds many of humanity's greatest achievements, including space travel, yet whether their use in scientific research is unethical, or whether it is a necessary means to an end is still up for debate. NHAs are so significant for research that a 2021 shortage of specifically bred monkeys, which are needed as test subjects for vaccines, led to talks about 'creating a strategic monkey reserve in the United States, an emergency stockpile similar to those maintained by the government for oil and grain' (Wee 2021). In this issue, Amy Clare addresses the relationship between scientists and the NHAs with whom they

work through interviews with researchers involved with CRISPR-Cas gene-editing technology. Genetic modification such as gene-editing prompts a variety of complex practical and ethical questions, which tie into the manipulation of animals through technological means more generally. The intersection of NHAs and technology has a long legacy, from selective breeding starting in the 18th century to the contemporary development of in vitro meat and beyond. Advances like cloning, for instance, which is nearly universally condemned for humans is considered acceptable for NHAs, with the FDA approving the use of cloned animals for food in 2008 (Tanne 2008). But at what points in these transformations are NHAs not animals anymore, and something different, something new? Do they become post-animals, hybrids, cyborgs? And with the first transplant of a kidney and then of a heart from a genetically-modified pig into a human (Rabin 2021, 2022), will we finally be willing to see that we as humans *are* animal? What about when NHAs remain the same but their environment has completely changed, as would be the case with de-extinction? Is it ethical to resurrect extinct species when the ecosystems in which they were entangled no longer exist? In this issue, Chantelle Mitchell and Jaxon Waterhouse begin to address these questions through their work on thylacine de-extinction. These questions are especially pressing to pose, with companies like Colossal having already received massive investment to work on bringing back the woolly mammoth (Zimmer 2021; Hunt 2021). Conversely, do we have a duty to help preserve, expand, or attempt to reinstitute environments before it is too late, as is the case with rewilding? Soledad Altrudi's contribution to this issue takes on this question through her work on rewilding in Patagonia, implicating also notions of interspecies care.

All of these questions around ethical and moral consideration of NHAs are brought into sharper relief through contemporary research on NHA capability and intelligence. Recent research has shown that, for example, pigs can be taught to play video games with their snouts, dogs can be taught to 'talk' using buttons, and fish can be taught to drive vehicles (Croney and Boysen 2021; Sanchez 2020; Treisman 2022). Octopuses – whose intelligence and inquisitiveness have been the subject of not only viral videos, like the one of a giant octopus at a Seattle aquarium escaping its enclosure, but also of films like *My Octopus Teacher* (Ehrlich and Reed 2020) – have been shown to be able to feel pain not only physically, but emotionally (Cassella 2021). In the case of *My Octopus Teacher*, the documentary never addresses the uneven and deep-rooted colonial, racist and racialised dynamics that permit the white South African protagonist the leisure time to pursue his relationship with the eponymous creature (Steingo 2021). What can we then learn from animal intelligence and behaviour when our conceptualisations of these are entangled and rooted in colonial legacies and western epistemologies that continue to be entrenched in anthropocentrism? Transdisciplinary approaches to NHAs and animal studies, from scientific work to cultural productions, need to be decolonised in a number of ways to permit us to conceive of different and more sustainable multispecies relations. This is a process of learning as much as of *un*learning, a process that is both intellectual and emotional, as Gavin Steingo notes when considering Alexis Pauline Gumbs' recent and important work *Undrowned: Black Feminist Lessons from Marine Mammals* (Gumbs 2020). In this work, Gumbs 'rethink[s] and refeel[s] [her] own relations, possibilities, and practices inspired by the relations, possibilities, and practices of advanced marine mammal life' (Gumbs 2020, 9). By decolonising language surrounding marine life, Gumbs offers new manners to conceive of NHAs that avoids anthropocentric

projections as well as promotes conceptual frames for multispecies entanglements. Indeed, anthropomorphic views of intelligence, which assume that only creatures that seem more like humans are capable of personhood, are very likely outdated and insufficient in understanding our animal-kin.

While the dominant settler-colonial and capitalist paradigms of our present age only sometimes take into consideration NHAs as individualised beings capable of subjective experience, there are some indications that this is improving. For example, as of 2022, Spain will consider the wellbeing of pets when evaluating custody claims over them in divorce suits (Pons 2022). The Spanish government also plans to ban wild animals in circuses, a move that has already been taken by the German Circus Roncalli, which, since 2018, uses holographic elephants, horses, and other animals to 'preserve the flavour of historic circuses while eliminating concerns of animal cruelty' (Katz 2019). Alongside holographic animals, there are also numerous CGI animals in film and television, as well as animal avatars and/or owners posting as their pets online. The rise of digital animals – particularly in the context of the entertainment industry – has positive implications for NHA welfare, but it also provokes questions about the future of the animal, and how digital representations may change the ways humans understand their interrelationality with NHAs. Jason Wallin's article on NHAs in open-world video games addresses what is at stake in these representations. Computerised animality occurs alongside the intersection of real animals and technology, such as the use of technologies like CattleEye, which surveils the 'welfare and performance' of milking cows through video monitoring, or the trial of VR headsets to reduce anxiety and increase milk yield in cows in Russia (2019) and Turkey (2022) ('Unleash Your Cow's Potential with Autonomous Video Monitoring' 2021; *BBC News* 2019; Davis 2022). The proliferation of NHAs in the digital sphere has led the study of the intersection of the digital and the animal to become an emergent topic of academic study. This includes work like Wallin's on video games, as well contemporary art (e.g. *Exhibiting Digital Animalities* 2021), and even the food system (e.g. *in vitro* meat and 'food as software'; see Sexton 2020). There is even a smartphone game called Wildchain that allows you to support conservation efforts by adopting a digital animal (Carey 2021). The tension here between the digital and the analogue, the embodied and disembodied, is a significant one, particularly within a global system that relies increasingly on digital mediation for day-to-day interactions. Though the gamification of human-NHA relations and entanglements can provide great learning opportunities, it also runs the risk of undermining the moral and ethical consideration that should be afforded to NHAs. Paying attention to how humans culturally construct NHAs, in the digital sphere and beyond, is necessary in order to tackle the serious ethical challenges that characterise our multi- and inter-species relations in a time of accelerated extinction and climate crisis. It is this attentiveness towards the present and imagined futures of human-NHA relations that unites the articles in this special issue.

The issue begins with Chantelle Mitchell and Jaxon Waterhouse's '"Has Anybody Seen a Tasmanian Tiger Lately?": Ethical and Ontological Considerations of Thylacine De-Extinction'. They explore de-extinction through the case study of the Tasmanian Tiger (*Thylacinus cynocephalus*), a marsupial that was originally native to the Australian mainland, Tasmania, and New Guinea, although in later years could only be found in Tasmania. Through a critical analysis of the case of the thylacine, Waterhouse and Mitchell argue that while de-extinction may present hope for the reversal of defaunation (that is, the loss of

NHA populations or species from a given area, whether through extinction or other causes), to attempt to de-extinct the thylacine is to ignore that it no longer has an ecological niche. Instead, they argue, the thylacine's true significance may not be in the potential for its resurrection, but rather in its power as a symbol of absence and of loss. Mitchell and Waterhouse's article is followed by Soledad Altrudi's 'Between Care and Control: the Patagonian Cougar's Tale'. Altrudi identifies the complex and contradicting dynamics of care and power in rewilding projects. In particular, her case study investigates a project that aims to restore Patagonian ecosystems in Santa Cruz, Argentina. This paper puts into dialogue technologies such as social media, photographic traps and satellite imagery with social science approaches to rewilding. In doing so, Altrudi explores how the habituation of pumas to human presence, for eco-tourism purposes, commodifies NHAs rather than instituting conservation practices. Following Altrudi's article is Paz Saavendra's 'The Entangled Past and Future of Midwifery and Cuys in Ecuadorian Andes', which offers an overview of healing practices involving the cuy (guinea pig) and their continuation and reinvention over time. Saavendra's article uses interviews and feminist methods to offer a novel focus on rural women's role in protecting and furthering human and NHA entanglements through traditional and Indigenous practices. Through storytelling and discussions with Kichwa midwives, Saavendra's intervention proposes a decolonised approach to medical episteme and praxes globally. Sonja Ganseforth's article, 'Shifting Matter and Meanings in Japanese Seafood Assemblages: Fish as Functional Food Cyborgs and Emblematic Cultural Commodities' is next in the issue. Drawing on anthropological research conducted in fishing communities in Kyushu, Japan, Ganseforth traces three 'schools of fish': fish as living, sentient animals; fish as technologised and industrialised commodities; and fish as romanticised symbols of traditional culture. She calls for a nuanced understanding of the hybridised realities of the both the fish and fishing communities, as these fishery assemblages respond to the polarised demands of neoliberal marketisation and the industrialised food system on the one hand, and the tourist industry and its fetishisation of rural Japanese identity on the other. Following Ganseforth's article is Amy Clare's 'What Stories Do We Tell About the Critters Involved with CRISPR-Cas? Examining Scientists' Reflections on Multispecies Relationships in Gene Editing Research'. In her article, Clare conducts a discourse analysis of ten interviews with scientists based in Germany, the US, and the UK working on CRISPR-Cas, a gene-editing technology. These scientists work either on xenotransplantation with pigs, or on gene drives with mosquitoes. Looking at the convergence of the scientific-technical and socio-cultural, affective, and environmental registers of people who work with NHAs in a laboratory setting, Clare examines whether opening up space for scientists to incorporate a consideration of NHAs *as* NHAs, and not just as research tools, can change the narrative around the use of NHAs in laboratories. Clare argues that making space for these kind of reflections by scientists 'can aid in untangling how perceptions of NHAs exist within, and transgress beyond, the laboratory setting and influence knowledge production practices' This type of ethnographic research helps demonstrate the gap between the often-sterilised language of laboratory practice and the actual embodied reality of the multispecies relations between scientists and their test subjects. Next in the issue is Miranda Niittynen's 'Apocalyptic Time: Vegan Taxidermy, the Remains of Dolly the Sheep, and Bio-engineered Art(ificiality) in the Time of Mass Species Extinction'. In this article, Niittynen investigates the manners in which taxidermy art can be utilised to think

through anthropogenic climate crisis and apocalyptic times. Niittynen opens a transdisciplinary dialogue between scientists and artists on the topic of extinction and fears surrounding it. The article focuses on a comparative reading of Dolly, a Finn Dorset sheep that has been cloned, and Robert Marbury's 'vegan' taxidermy sculpture of a woolly mammoth, to investigate blurred boundaries and knowledge limitations. Following Niitynen's article is Jason Wallin's 'Game Preserves: Digital Animals at the Brink of the Post-Anthropocene'. In his article, Wallin explores the status and function of 'hyperreal' digital representations of NHAs within the context of Anthropocene thought. He does so through the medium of contemporary open-world interactive video games, particularly the *Fallout* franchise (1997–2018) and *The Outer Worlds* (2019), arguing that these types of games act as a crucial site for the cultural construction and consolidation of human attitudes towards, and interactions with, NHAs. His intervention demonstrates the ways in which these games further Anthropocene and Capitalocene concepts of human superiority and the cheapening of non-human life as a commodity, whilst simultaneously acknowledging the 'relational co-becoming' of human-NHA kinship that is demonstrated through characters like *Fallout*'s Dogmeat. Closing out the issue is Daisy Reid's 'Queer Desires and Sugary Kisses: The Sweetness of Interspecies Encounters in Yōko Tawada's *Memoirs of a Polar Bear*'. In this article, Reid investigates Tawada's novel, originally published in German in 2014 and translated into English in 2016, and its multi- and interspecies kinships that unsettle heteronormative and reproductive standardisations. Using queer theory and building on Donna Haraway's work, Reid considers the role of sweetness and affective aesthetics in proposing new ways to consider the human-NHA entangled relations depicted in Tawada's novel. These eight articles take seriously the cultural, social, political, technological, and scientific mediations that inform human-NHA relationships. All together, they provide a snapshot into the ways NHAs – and human relationships to them – are culturally constructed, and thereby how they might be imagined otherwise. Underlaid with the urgency of climate catastrophe and informed by theoretical critiques of the Anthropocene, this special issue centres a consideration of NHAs as a necessary component in developing more just planetary futures.

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Endnotes

1. We use 'our' here in reference to our positions in a capitalist, primarily Global North, heteronormative, patriarchal context, and acknowledge that there are many communities for whom this 'new' way of living is in fact a very old way of interacting with and understanding the nonhuman.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Dr Giulia Champion is a Lecturer in the Interdisciplinary Studies Centre at the University of Essex and a Research Assistant at the Centre for Interdisciplinary Methodologies at the University of Warwick and in the School of Arts and Creative Industries at Edinburgh Napier University for a project on Scottish Shores. Her research investigates Decolonial theory, Latin American Studies, Extractivism and the Blue Humanities. Her publications include a monograph, Extractivism and Climate Crisis in Latin American and Caribbean Literatures: Consuming the Américas (Palgrave Macmillan, 2023) and she is the co-editor of Ethical Futures and Global Science Fiction (Palgrave Macmillan, 2020), Decolonizing the Undead: Rethinking Zombies in World-Literature, Film and Media (Bloomsbury, 2022), and the editor of Interdisciplinary Essays on Cannibalism: Bites Here and There (Routledge, 2021). She is also co-editing two journal special issues forthcoming in 2022 on "Intersections of Activism and Academia" with the Bulletin of Latin American Research and on "Comparative Antropofagias: Shadow Histories of the Transatlantic Lusophone World" with Portuguese Studies.

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References

Barnosky, A. D., N. Matzke, S. Tomiya, G. O. U. Wogan, B. Swartz, T. B. Quental, C. Marshall, et al. 2011. "Has the Earth's Sixth Mass Extinction Already Arrived?" *Nature* 471 (02): 51–57.

BBC News. 2019. "Russian Cows Get VR Headsets "To Reduce Anxiety"." 27 November 2019. https://www.bbc.co.uk/news/world-europe-50571010 .

BBC News. 2021. "Pigs Can Play Video Games with Their Snouts, Scientists Find." 11 February 2021, sec. Technology. https://www.bbc.co.uk/news/technology-56023720.

Bould, M. 2021. *The Anthropocene Unconscious*. London: Verso.

Brower, M. 2021. *Exhibiting Digital Animalities*. Toronto: Public Books .

Carey, T. 2021. "Ow You Can Save Endangered Species — Just by Playing Games." *Freethink: Move the World (blog)*. March 10. https://www.freethink.com/articles/adopt-a-digital-animal?utm_medium=Social&utm_campaign=echobox_freethink&utm_source=Facebook&fbclid=IwAR2MvnL5scmtf8lID7iVT19KX1RpdE8wmAvAwcjWp1zPWKn74tFwLjZvm3I#Echobox=1615420549&var=1615420574_0_1_19

Cassella, C. 2021. "Octopuses Not Only Feel Pain Physically, but Emotionally Too, First Study Finds." *Science Alert* (blog). March 5. https://www.sciencealert.com/scientists-identify-the-first-strong-evidence-that-octopuses-likely-feel-pain?fbclid=IwAR0KzgNsZ_WJZhjp9nRZFs_P3Ty6wBmj17_mFAIYTam4R-88GViJ2fO9_dI

Croney, C. C., and S. T. Boysen. 2021. "Acquisition of a Joystick-Operated Video Task by Pigs (Sus Scrofa)." *Frontiers in Psychology* 12: 142. doi:10.3389/fpsyg.2021.631755.

Davis, M. 2022. "Cows Use VR Goggles Tricking Them into Thinking Its Summer to Reduce Stress, Anxiety and Produce More." *The Science Times*, January 10. https://www.sciencetimes.com/articles/35465/20220110/cows-turkey-tricked-thinking-summer-using-vr-goggles-reduce-stress.htm.

DeLoughrey, E. M. 2019. *Allegories of the Anthropocene*. Durham: Duke University Press.

Doucleff, M. 2021. "How SARS-CoV-2 in American Deer Could Alter the Course of the Global Pandemic." NPR. https://www.npr.org/sections/goatsandsoda/2021/11/10/1054224204/how-sars-cov-2-in-american-deer-could-alter-the-course-of-the-global-pandemic?t=1637519903992 .

Dunn, N. 2021. "Rethinking Places After Dark." Presented at the Cumbria Dark Skies Festival, Online, February 17.

Ehrlich, P., and J. Reed. 2020. My Octopus Teacher. Netflix.

Gerber, P. J., H. Steinfeld, B. Henderson, A. Mottet, C. Opio, J. Dijkman, A. Falcucci, and G. Tempio. 2013. *Tackling Climate Change Through Livestock – a Global Assessment of Emissions and Mitigation Opportunities*. Rome: Food and Agriculture Organization of the United Nations (FAO).

Gibb, R., L. H. V. Franklinos, D. W. Redding, and K. E. Jones. 2020. "Ecosystem Perspectives are Needed to Manage Zoonotic Risks in a Changing Climate." *BMJ* 371: m3389. doi:10.1136/bmj.m3389.

Goodland, R., and J. Anhang. 2009. *Livestock and Climate Change: What if the Key Actors in Climate Change are . . . Cows, Pigs, and Chickens?*. Washington: Worldwatch Institute.

Gray, G. C., D. W. Trampel, and J. A. Roth. 2007. "Pandemic Influenza Planning: Shouldn't Swine and Poultry Workers Be Included?" *Vaccine* 25 (22): 4376–4381. doi:10.1016/j.vaccine.2007.03.036.

Gumbs, A. P. 2020. *Undrowned: Black Feminist Lessons from Marine Mammals*. Chico, CA: AK Press.

Haraway, D. 2016. *Staying with the Trouble: Making Kin in the Chuthulucene*. Durham: Duke University Press.

Heise, U. K. 2016. *Imagining Extinction: The Cultural Meanings of Endangered Species*. Chicago: University Of Chicago Press.

Heise, U. K. 2017. "Introduction: Planet, Species, Justice–and the Stories We Tell About Them." In *The Routledge Companion to the Environmental Humanities*, U. K. Heise; J. Christensen, and M. Niemann, 1–10. London: Routledge.

Holpuch, A. 2013. "Scientists Breed Glow-In-The-Dark Rabbits." *The Guardian*, August 13. https://www.theguardian.com/world/2013/aug/13/glow-in-dark-rabbits-scientists.

Hugus, E. 2020. "Finding Answers in the Ocean: In Times of Uncertainty, the Deep Sea Provides Potential Solutions." *Oceanus*, November 9. https://www.whoi.edu/oceanus/feature/finding-answers-in-the-ocean/ .

Hunt, K. 2021. "Scientists Want to Resurrect the Woolly Mammoth. They Just Got $15 Million to Make It Happen." *CNN*, September 13, International edition. https://edition.cnn.com/2021/09/13/world/woolly-mammoth-resurrect-deextinction-scn/index.html .

Jones, B. A., D. Grace, R. Kock, S. Alonso, J. Rushton, M. Y. Said, D. McKeever, et al. 2013. "Zoonosis Emergence Linked to Agricultural Intensification and Environmental Change." *Proceedings of the National Academy of Sciences* 110 (21): 8399. doi:10.1073/pnas.1208059110.

Katz, B. 2019. "A German Circus Uses Stunning Holograms Instead of Live Animal Performers." *Smithsonian Magazine*, June 7. https://www.smithsonianmag.com/smart-news/german-circus-uses-stunning-holograms-instead-live-animal-performers-180972376/.

Kolbert, E. 2014. *The Sixth Extinction: An Unnatural History*. New York: Henry Holt and Co.

Livestock's Long Shadow: Environmental Issues and Options. 2006. Rome: Food and Agriculture Organization of the United Nations (FAO). https://www.fao.org/3/a0701e/a0701e.pdf

Living Planet Report 2018. 2018. Gland, Switzerland: World Widlife Fund. https://c402277.ssl.cf1.rackcdn.com/publications/1187/files/original/LPR2018_Full_Report_Spreads.pdf.

Marani, M., G. G. Katul, W. K. Pan, and A. J. Parolari. 2021. "Intensity and Frequency of Extreme Novel Epidemics." *Proceedings of the National Academy of Sciences* 118 (35): e2105482118. doi:10.1073/pnas.2105482118.

McHugh, N. 2007. "It's in the Meat: Science Fiction and the Politics of Ignorance." In *SciFi in the Mind's Eye: Reading Science Through Science Fiction*, edited by M. Grebowicz 39–56. Chicago and La Salle, Illinois: Open Court.

Morton, T. 2010. *The Ecological Thought*. Cambridge, MA: Harvard University Press.

Murphy Marcos, C. 2021. "The Unconventional Weapon Against Future Wildfires: Goats." *The New York Times*, September 18. https://www.nytimes.com/2021/09/18/business/wildfires-goats-prevention.html .

NOAA. 2021. "How Much Oxygen Comes from the Ocean?" National Ocean Service. Accessed 26 February 2021. https://oceanservice.noaa.gov/facts/ocean-oxygen.html#: :text=At%20least%20half%20of%20Earth's%20oxygen%20comes%20from%20the%20ocean.&text=Scientists%20estimate%20that%2050%2D80,some%20bacteria%20that%20can%20photosynthesize.

Oyster-Tecture. n.d. "Company Website. SCAPE Landscape Architecture." Accessed 22 January 2022. https://www.scapestudio.com/projects/oyster-tecture/.

Pons, C. 2022. "Dog Custody: Spain to Consider Pets' Welfare in Divorce Battles." *Reuters*, January 6. https://www.reuters.com/world/europe/dog-custody-spain-consider-pets-welfare-divorce-battles-2022-01-05/.

Rabin, R. C. 2021. "In a First, Surgeons Attached a Pig Kidney to a Human — and It Worked." *New York Times*, October 19. https://www.nytimes.com/2021/10/19/health/kidney-transplant-pig-human.html?smid=fb-nytimes&smtyp=cur&fbclid=IwAR33PMCOor33IKzZi-U2F9n6Hj83kQ_aBDg_4AIbMkZSGSDU4GwBH8zkpL8 .

Rabin, R. C. 2022. "In a First, Man Receives a Heart from a Genetically Altered Pig." *New York Times*, January 10. https://www.nytimes.com/2022/01/10/health/heart-transplant-pig-bennett.html?smtyp=cur&smid=tw-nytimes .

Roberts, M. 2020. "Lu Virus with "Pandemic Potential" Found in China." *BBC News Online*, June 30. https://www.bbc.com/news/health-53218704.

C. Rupprecht; D. Cleland; N. Tamura; R. Chaudhuri, and S. Ulibarri, edited by. 2021. *Multispecies Cities: Solarpunk Urban Futures*. Albuquerque, NM: World Weaver Press.

Saenz, R. A., H. W. Hethcote, and G. C. Gray. 2006. "Confined Animal Feeding Operations as Amplifiers of Influenza." *Vector Borne and Zoonotic Diseases (Larchmont, N.Y.)* 6 (4): 338–346. doi:10.1089/vbz.2006.6.338.

Sanchez, K. 2020. "How Bunny the Dog is Pushing Scientists' Buttons: TikTok's Most Famous Talking Dog Has Inspired Some Serious Research." Accessed 11 November 2020. https://www.theverge.com/21557375/bunny-the-dog-talks-researchers-animal-cognition-language-tiktok.

Sexton, A. E. 2020. "Food as Software: Place, Protein, and Feeding the World Silicon Valley–style." *Economic Geography*, November, 1–21. 10.1080/00130095.2020.1834382.

Steingo, G. 2021. "Learning from Alexis (Review of Alexis Pauline Gumbs's Undrowned: Black Feminist Lessons from Marine Mammals)." https://www.boundary2.org/2021/05/gavin-steingo-learning-from-alexis-review-of-alexis-pauline-gumbss-undrowned-black-feminist-lessons-from-marine-mammals/.

Tanne, J. H. 2008. "FDA Approves Use of Cloned Animals for Food." *BMJ (Clinical Research Ed)* 336 (7637): 176–177. doi:10.1136/bmj.39468.528368.DB.

Treisman, R. 2022. "Israeli Scientists Have Trained Goldfish to Drive, in a Scene Out of a Dr. Seuss Book." *NPR*, January 11. https://www.npr.org/2022/01/11/1072095219/goldfish-driving-car-israel-study7

"Unleash Your Cow's Potential with Autonomous Video Monitoring." 2021. *CattleEye*. April 26. https://cattleeye.com/

Vint, S. 2010. *Animal Alterity: Science Fiction and the Question of the Animal*. Liverpool: Liverpool University Press.

Wake, D., and V. Vredenburg. 2008. "Are We in the Midst of the Sixth Mass Extinction? A View from the World of Amphibians." *Proceedings of the National Academy of Sciences* 105 (Supplement 1): 11466–11473.

Watts, J. 2021. "Race to the Bottom: The Disastrous, Blindfolded Rush to Mine the Deep Sea." *The Guardian*, September 27. https://www.theguardian.com/environment/2021/sep/27/race-to-the-bottom-the-disastrous-blindfolded-rush-to-mine-the-deep-sea .

Wee, S.-L. 2021. "Future Vaccines Depend on Test Subjects in Short Supply: Monkeys." Accessed 23 February 2021. https://www.nytimes.com/2021/02/23/business/covid-vaccine-monkeys.html.

Witte, W. 1998. "Medical Consequences of Antibiotic Use in Agriculture." *Science* 279 (5353): 996–997. doi:10.1126/science.279.5353.996.

Zimmer, C. 2021. "A New Company with a Wild Mission: Bring Back the Woolly Mammoth." *New York TImes*, September 13. https://www.nytimes.com/2021/09/13/science/colossal-woolly-mammoth-DNA.html?smtyp=cur&smid=fb-nytimes&fbclid=IwAR24GPxvx8fIQbON6dSavJmv8cGxTovdFY4HpgiSqFt3NioY09Byl0-ua-Q.