

Globalizing animals

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Globalizing Animals: Histories for the Anthropocene



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Globalizing Animals: Histories for the Anthropocene

Maastricht, 6 November 2021

Raf De Bont

*Globalizing Animals:
Histories for the Anthropocene*

Dames en Heren,
Ladies and gentlemen,

In 1883, the quagga - a subspecies of the plains zebra known for its sparse striping and shrill barking - went extinct. It did so *not* in the grasslands of southern Africa (its natural habitat), but in the city centre of Amsterdam. It was, after all, in Artis Zoo that the last individual would succumb in the stables under the library. Contemporaries did not know this particular individual was the last of its kind, and little information remains of its life history. We do know, however, that it had been acquired sixteen years earlier from the zoo of Antwerp, which at that point was the global centre of the exotic animal trade. Its life trajectory before that remains unclear, but there is some evidence that the Antwerp zoo had purchased the quagga in London from a company owned by the German-Jewish Mosenthal brothers - which was one of the most important colonial trading corporations at the time, headquartered in Cape Town. Obviously, a living quagga must have been a rare object of transport. More typically, Mosenthal cargo consisted of ostrich feathers and animal hides that were brought to Europe and of Merino sheep that travelled in the other direction, from France to the Karoo. Such trade, thus, not only made exotic animals visible to the Amsterdam bourgeoisie, but it also drastically changed the ecology of southern Africa where domestic breeds followed colonists and outcompeted wild animals at a rapid pace. The animal catcher who got hold of the last quagga in Orange Free State did so in a landscape that was undergoing radical transformations - transformations fuelled by the fact that the landscape in question had become integrated in a global economy.¹

The story of the extinction of the quagga - in Amsterdam *and* southern Africa - is, in short, a story of globalization. The quagga, however, is not a typical actor in histories written about the globalization process. Undomesticated animals, like indeed plants, ecosystems or the natural world more generally, have only received meagre attention in these histories. The historian Dipesh Chakrabarty highlighted exactly this point when he wrote in 2015 that - I quote - 'Humans are central to *all*

¹ For a more in depth account, see: Raf De Bont, 'De Laatste Quagga', *Wonderkamer: Magazine voor Wetenschapsgeschiedenis*, 1:1 (2020), 66-69.

stories of globalization, celebratory or critical'. 'Stories of globalization', he continued, have always been 'homocentric in nature.'² Chakrabarty *stressed* that such a focus is problematic - particularly for the times we currently live in. Elsewhere, he has indicated how our sense of history has been shaken by the advent of the Anthropocene - the proposed geological epoch in which humans significantly alter the geology and the ecosystems of Earth as a whole. In the Anthropocene, Chakrabarty indicated, 'the distinction between human and natural histories [...] has begun to collapse'.³ He saw human-induced climate change as particularly illustrative of this merger between the histories of the human and the natural. Yet, there are many more examples one can think of. The global COVID pandemic would be another obvious candidate, exposing an intercontinental network that consists of viruses as well as airplanes and handshakes. It even connects the organization of this very auditorium to pangolins and bats in the interior of China. The COVID crisis, like indeed the climate crisis, should certainly prompt us to re-assess our histories of globalization. And part of this reassessment should certainly be to bring the *interaction* of humans with the non-human environment much more to the fore than is currently customary.

In what follows, I will explore what would happen if we part from the homocentric stories Chakrabarty alludes to, and I will develop some ideas about how a more-than-human history of globalization could potentially look like. Before *further* complicating the notion of globalization, however, it is probably helpful to quickly revisit some of the complications scholars have wrestled with so far.

I.

It has become a truism that globalization is a contested concept. Since its rise to fashion in the 1990s, scholars from various disciplines have disagreed over the exact meaning of the term, over whether it usefully describes an actually existing phenomenon, and, if so, when and where globalization exactly has taken place, how comprehensive its scope has been, and what its precise implications have been. Yet, despite ongoing discussions, most present-day definitions represent it in one way or another as an 'expansion, concentration, and acceleration of worldwide relations'.⁴ Several authors, furthermore, have added that these expanding relations are mediated by a variety of flows - most notably the flows of people, products, ideas and money. As a result, histories of globalization often foreground the development of infrastructures that have enabled these flows; think of railroads, refrigerating facilities, airports, telegraph lines and the internet.⁵

In an early phase, social theorists and journalists used the globalization concept to describe a contemporary phenomenon.⁶ Yet, historians - in a move typical for their profession - were quick to challenge the newness of globalization, highlighting that long-distance connections and circulations have been with us for centuries and even millennia.⁷ Several critics, furthermore, proved uneasy about the term itself, which, apart from presentist, they deemed teleological, universalizing and totalizing. In response to such criticism, most scholars using the term today make sure to indicate globalization should not be understood as a self-propelled, uniform and autonomous process - describing it as a contingent, heterogeneous and incomplete phenomenon at

2 Dipesh Chakrabarty, 'The Human Condition in the Anthropocene', The Tanner Lectures in Human Values, Yale University, February 18-19, 2015, 141. Available at: <https://tannerlectures.utah.edu/Chakrabarty%20manuscript.pdf>

3 Dipesh Chakrabarty, 'The Climate of History: Four Theses', *Critical Inquiry*, 35:2 (2009), 197-222.

4 For the quote: Jürgen Osterhammel and Niels P. Petersson, *Globalization: A Short History* (Princeton and Oxford: Princeton University Press, 2005), 5.

5 It would be impossible to review the virtually endless literature on globalization here. Good overviews of the historical scholarship include: Pierre-Yves Saunier, 'Globalization', in: Akira Iriye et Pierre-Yves Saunier (eds.) *The Palgrave Dictionary of Transnational History* (London: Palgrave Macmillan, 2009), 456-462; Jürgen Osterhammel, 'Globalizations', in: Jerry H. Bentley (ed.) *The Oxford Handbook of World History* (Oxford: Oxford University Press, 2011), 89-104.

6 For an outline of the ways in which social theorists have used the concept, see: William I. Robinson, 'Theories of Globalization', in: George Ritter (ed.) *The Blackwell Companion to Globalization* (Malden: Blackwell, 2007), 125-143.

7 Influential in this regard were, amongst others: Anthony G. Hopkins (ed.) *Globalization in World History* (London: Norton, 2002); Robie Robertson, *The Three Waves of Globalization: A History of a Developing Global Consciousness* (London: Zed Books, 2003); Peter N. Stearns, *Globalization in World History* (London: Routledge, 2010).

best.⁸ Yet, even then (or maybe better, *certainly* then), globalization remains a powerful concept. Changes in cross-continental connectivity matter historically, and they have an impact on personal lives. Just one individual and very localized example: As a child in the 1980s, I did have toys ‘made in China’, but my worldview was largely shaped by Belgian comic books and national television; my sons, however, read Japanese manga, follow international YouTube stars and play online games with players from all over the world.

YouTube and manga are indeed typical subjects within the current scholarship on globalization that - as indicated - focusses on humans and human products. This does not preclude, however, that *some* scholars have started to address the relation between globalization and the non-human environment. One group, mostly political scientists and geographers, have looked into what they describe as ‘environmental globalization’, or the ways in which environmental ideas and policies have become globally entangled and homogenized. This scholarship, thus, highlights cultural and organizational developments, focussing, for instance, on the increasing role of international environmental NGOs or multilateral treaties.⁹ A second group situates its subject on the other side of the nature-culture dichotomy. Largely consisting of environmental historians and ecologists, this group has written about ‘biological’ or sometimes ‘ecological globalization’ - terms that refer to the increasing global dispersal of particular animals, plants and diseases provoked by human migration and trade.¹⁰ The most iconic episode in the histories of such a biological homogenization is

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- 8 For criticism that develops the above points, see e.g., Frederic Cooper, ‘What is the Concept of Globalization Good for? An African Historian’s Perspective’, *African Affairs*, 100:399 (2002), 189-213; Saunier, ‘Globalization’ (2009).
- 9 See: Alan Grainger, ‘Environmental Globalization and Tropical Forests’, *Globalizations*, 2:3 (2005), 335-348; Karl S. Zimmerer, ‘Geographical Perspectives on Globalization and Environmental Issues: The Inner-Connections of Conservation, Agriculture and Livelihoods’, in: Karl S. Zimmerer (ed.) *Globalization and New Geographies of Conservation* (Chicago and London: The University of Chicago Press, 2006), 1-44; Steven Yearley, ‘Globalization and the Environment’ in: George Ritter (ed.) *The Blackwell Companion to Globalization* (Malden: Blackwell, 2007), 239-243. For historical work with a similar interest: Wolfram Kaiser and Jan-Henrik Meyer (eds.) *International Organizations and Environmental Protection: Conservation and Globalization in the Twentieth Century* (New York and Oxford: Berghahn, 2017).
- 10 For instance: Wouter van der Weijden, Rob Leeuwis, Pieter Bol, *Biological Globalization: Bio-Invasions and their Impact on Nature, the Economy and Public Health* (Zeist: KNNV Uitgeverij, 2007); John R. McNeill, ‘Biological Exchange in Global Environmental History’, in: John R. McNeill and Erin Stewart Mauldin (eds.) *A Companion to Global Environmental History* (Oxford: Wiley-Blackwell, 2012), 433-451; Brett M. Bennett ‘Epilogue: A Global History of Species Introduction and Invasion: Reconciling Historical and Ecological Paradigms’, in: Ulrike Kirchberger and Brett M. Bennett (eds.) *Environments of Empire: Networks and Agents of Ecological Change* (Chappell Hill: University of North Carolina Press, 2020), 224-246.

certainly the so-called Columbian exchange - the transfer of organisms between continents that took place in the wake of Columbus’s landing in America.¹¹ The scholarship that discusses such forms of ‘biological globalization’, however, does not really speak to that of the students of ‘environmental globalization’ - thematically or chronologically.

In order to develop a more-than-human conception of globalization, I think we not only have to expand these two existing approaches further but also put them in conversation with each other. Globalizing ideas and policies regarding non-human organisms, after all, respond to and have an impact on the actual lives and trajectories of these organisms. Conceived in this way, humans and non-humans are entangled in what Bruno Latour and Donna Haraway describe as ‘naturecultures’.¹² Such a ‘naturecultural’ perspective, then, allows for highlighting the ‘relational agencies’ in the history of globalization in which humans and non-human organisms continuously affect each other.¹³ Both humans and non-human organisms, I would argue, are caught up in the changing relations, circulations and infrastructures that are seen as characteristic of globalization.

In what follows, I will work out this point by focussing on the late modern period and by looking particularly at the changing interaction between humans and undomesticated *animals* that move (or are *being* moved) over large distances. Such animals, I feel, provide good organisms to think with - because in their movement they often unsettle the status quo and, as such, become objects of explicit reflection. Between roughly the late nineteenth century and today, changing animal mobilities - tied in various ways to the globalization process - have gained a prominent place on the agenda of science, media and policymaking. Yet, while humans have sought ways to control these trajectories, their power to do so has always remained partial.

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- 11 The term was coined in Alfred W. Crosby, *The Columbian Exchange: Biological and Cultural Consequences of 1492* (Westport: Praeger, 2003). Crosby, however, does not discuss this exchange in terms of globalization.
- 12 Bruno Latour, *We Have Never been Modern* (Cambridge, Massachusetts: Harvard University Press, 1993); Donna Haraway, *The Companion Species Manifesto: Dogs, People and Significant Otherness* (Chicago: Prickly Paradigm Press, 2003).
- 13 Mieke Roscher, ‘Actors or Agents? Defining the Concept of Relational Agency in (Historical) Wildlife Encounters’, in: Alexandra Böhm and Jessica Ullrich (eds.), *Animal Encounters: Kontakt, Interaktion und Relationalität* (Berlin: J.B. Metzler, 2019), 149-170.

II.

A more-than-human conception of globalization opens up a whole range of questions and themes that, so far, have remained marginal in the globalization literature. I will outline a few of these.

The first theme concerns the ways in which the material *infrastructures* of globalization have affected the movement of undomesticated animals across the globe.¹⁴ It is clear that they have done so in myriad ways. The rise of the modern zoo, for instance, (which more than any other institution made non-domesticated animals visible for large audiences by shipping them from across the world to the expanding metropolises of Western Europe and North America), clearly followed the logic of globalization. Nineteenth-century zoo collections developed in parallel to networks of railways, steamship lines and trading companies. In this way, shipments of exotic animals relied on the same infrastructure as the other globally unequal exchanges that fuelled the Industrial Revolution.¹⁵ It was certainly no coincidence that zoos developed in places where the wealth of the Industrial Revolution accumulated - starting in the UK, then gradually spreading over the European continent and later to the US. The same harbour cities that in the second half of the nineteenth century became crucial hubs in networks of global trade (such as Hamburg and Antwerp) also turned into centres for the global circulation of zoo animals.¹⁶

Globalization, furthermore, also left its traces in the ambitions and self-presentation of nineteenth-century zoo enthusiasts. Many initiators of zoological gardens saw their institutions as places where exotic animals could be acclimatized, domesticated and bred for utilitarian purposes.¹⁷ The horizon of these acclimatizers was global. In a book of 1861, Isidore

¹⁴ More than historians, geographers have engaged with the topic of animal movement (although rarely from the perspective of globalization). For a recent overview: Timothy Hodgetts and Jamie Lorimer, 'Animals' Mobilities', *Progress in Human Geography*, 44:1 (2020), 4-26.

¹⁵ About the ways in which the Industrial Revolution relied on (and affected) 'ecologies in the periphery', see: Christophe Bonneuil and Jean-Baptiste Fressoz, *The Shock of the Anthropocene* (London and New York: Verso, 2017), 228-235.

¹⁶ Eric Baratay and Elisabeth Hardouin-Figuier, *Zoo: A History of Zoological Gardens in the West* (London: Reaktion Books, 2002), 80-83; Violette Pouillard, *Histoire des zoos par les animaux: Impérialisme, contrôle, conservation* (Ceyzerieu: Champ Vallon, 2019), 51-54.

¹⁷ Michael A. Osborne, 'Acclimatizing the World: A History of the Paradigmatic Colonial Science' *Osiris*, 15 (2000), 135-151.

Geoffroy Saint-Hilaire, the founder of the French *Société zoologique d'acclimatation*, not only presented his own institution as 'cosmopolitan', but he also believed the task of his society was to turn exotic animals into 'cosmopolitans'. An early success, he boasted, was the silk worm, which - I quote - 'nature had made exclusively Asiatic, [while] culture turned it into a cosmopolitan'.¹⁸ Geoffroy's initiatives were driven by visions of progress and imperial conquest, but he clearly also tied them to narratives of globalization. I quote again: 'Through the perfection of navigation, the multiplicity of international communications, and the establishment of European colonies in every corner of the globe, the natural riches of the entire world are at our disposal.'¹⁹

In the twentieth century, dreams of acclimatization gradually vanished, but the reliance of zoos on global networks of trade remained. Furthermore, the format of the modern public zoo *itself* - and the particular bourgeois values it incarnated - globalized.²⁰ In the early twentieth century, newly established zoos outside of Europe and the US were often still tied to colonial enterprises, serving mainly as transit points that catered to the North.²¹ Alongside these, however, an increasing number of zoological gardens that targeted local audiences were set up in Asia, Latin America and (to a lesser extent) Africa.²² This evolution continues. By the early twenty-first century, the World Association of Zoos and Aquariums (WAZA) counted over 10,000 zoos worldwide that were visited by more than 700 million people annually.²³ Since the 1970s, international legislation has largely (but not entirely) cut off these zoos from supply from the wild. Today, the trajectories of zoo animals are mostly driven by little researched but carefully orchestrated exchanges between zoological gardens. The millions of animals involved have become 'cosmopolitans' of sorts. Yet, maybe not exactly as Geoffroy Saint-Hilaire had anticipated.

18 Isidore Geoffroy Saint-Hilaire, *Acclimatation et domestication des animaux utiles* (Paris : Librairie Agricole de la Maison Rustique, 1861), 458.

19 Ibid., 5.

20 According to Nigel Rothfels, the 'critical essence' of the zoo is that it is 'a place designed by the bourgeoisie for its own education and amusement'. Rothfels, *Savages and Beasts: The Birth of the Modern Zoo* (Baltimore and London: The Johns Hopkins University Press, 2002), 34.

21 Pouillard, *Histoire des zoos*, 274-279.

22 For an overview: Vernon J. Kislring Jr. (ed.) *Zoo and Aquarium History: Ancient Animal Collections to Zoological Gardens* (Boca Raton: CRC Press, 2001).

23 Andrew Tribe and Rosemary Booth 'Assessing the Role of Zoos in Wildlife Conservation', *Human Dimensions of Wildlife*, 8:1 (2003), 65-74; Markus Gusset and Gerald Dick, 'The Global Reach of Zoos and Aquariums in Visitor Numbers and Conservation Expenditures', *Zoo Biology*, 30:5 (2011), 566-569.

The infrastructures of globalization have not only intensified intentional movements of animals, but also unintentional ones. In 1930, the British ecologist Charles Elton wrote in his *Animal Ecology and Evolution* that - I quote - 'with the tremendous radiating power of the world's transport, the introduction of alien animals is now almost a daily occurrence.'²⁴ In the aftermath of the Second World War, Elton would play a major part in the professionalization of the study of such alien animal movements, which he described with military metaphors that clearly suited the *Zeitgeist*. He referred to them as 'invasions', 'explosions', occasionally even 'bombardments'.²⁵ His examples were numerous. A particularly gripping one concerned the animal mobilities enabled by the Suez Canal. Present-day historians see the canal, opened in 1869, as both a crucial hub and a chokepoint of late nineteenth-century globalization, enabling the movement of particular kinds of people, ideas and cargo - including that of zoo animals.²⁶ Elton indicated, however, that also crabs, lobsters and oysters from the Red Sea used the canal to 'invade' the Mediterranean. Later, ecologists would label this phenomenon as the Lessepsian migration (after the French engineer of the canal), and they highlighted its continued ecological impacts.²⁷ Similar 'invasions' could be seen along other human infrastructures. Elton, for instance, discussed the dispersal of the Argentine ant along the US railway system and that of the Chinese mitten crab via the sea-water ballast tanks of ships travelling to European harbours and rivers.²⁸ Such forms of dispersal only intensified in the period after Elton wrote his major book on the topic. For instance, the advent of the container (the material symbol of late twentieth-century globalization) would be accompanied by a whole new assortment of invasions, ranging from the brown tree snake to the Khapra beetle.²⁹

While the infrastructures of globalization allow for the movement of

24 Charles S. Elton, *Animal Ecology and Evolution* (Oxford: Clarendon, 1930), 11.

25 Charles S. Elton, *The Ecology of Invasions by Animals and Plants* (London: Methuen & Co. 1958), 7-10 and 40.

26 Baratay and Hardouin-Figuier, *Zoo*, 120; Valeska Huber, *Channeling Mobilities: Migration and Globalisation in the Suez Canal Region and Beyond, 1869-1914* (Cambridge: Cambridge University Press, 2013).

27 Francis Dov Pot, *Lessepsian Migration: The Influx of Red Sea Biota in the Mediterranean by Way of the Suez Canal* (Berlin, Heidelberg, New York: Springer, 1978).

28 Elton, *The Ecology of Invasions*, 18-19 and 65-66.

29 Dean R. Paini and Dennis Yemshanov, 'Modelling the Arrival of Invasive Organisms via the International Marine Shipping Network: A Khapra Beetle Study', *PlosOne* 7:9 (2012), 10.1371/annotation/9f9b4966-1f98-492c-92bf-7e020ee4c006; Richard M. Engeman, Aaron B. Shiels and Criag S. Clark, 'Objectives and Integrated Approaches for the Control of the Brown Tree Snakes: An Updated Overview', *Journal of Environmental Management*, 219:1 (2018), 115-124.

some undomesticated animals, they clearly hamper the mobility of others. Railroads, shipping lines, highways, pipelines and power cables interfere with all kinds of animal trajectories. Furthermore, connections to the global economy fuel local demands for wildlife products, timber and agricultural produce, thus stimulating hunting, deforestation and the drainage of wetlands. All this has historically unsettled animal mobilities, notably of migrating species that rely on a range of interconnected spaces.³⁰ In this context, it is important to remember that globalization not only hinges on infrastructures of connection but also on infrastructures of obstruction. One of these, the historian Reviel Netz has argued, consists of lines of barbed wire. Netz has shown how in the American West of the late nineteenth century, this new invention enabled a regional specialization in cattle farming for a globalizing market. As such, barbed wire was crucial in the division of labour and the spatial divergence between urban and rural America. Important for our discussions today is that it also *dis*-abled the movement of many forms of wildlife, most notoriously that of the migrating herds of American bison. It did not take long, for that matter, until barbed wire was used not only to contain livestock, but also to shield off railway lines that transported cattle to meat processing plants in the city. 'The same lines of connection', Netz concluded, 'acted as lines of disconnection.'³¹

30 See, e.g., Robert M. Wilson, 'Mobile Bodies: Animal Migration in North American History', *Geoforum*, 65 (2015), 465-472.

31 Reviel Netz, *Barbed Wire: An Ecology of Modernity* (Middletown, Connecticut: Wesleyan University Press, 2004), 235.

III.

While human activities increasingly shaped animal mobility across the globe, it took until the twentieth century for the sciences of such mobility to professionalize. For a long time, knowledge of animal movement (in its various forms) had been mostly the preserve of hunters, fishermen, traders, breeders, collectors and state-employed surveyors.³² Throughout the twentieth century, however, the ways in which animals move and can be moved by humans increasingly became the object of specialized study in emerging disciplines such as animal migration studies, (the aforementioned) invasion ecology, zoo biology and reintroduction science. Such fields have generated varied bodies of knowledge that shape our interaction with the natural world in important respects. Historians of science, however, are only beginning to take an interest in the history of these disciplines.

Even a superficial look at the history of research into long-distance animal movement indicates that it posed a lot of challenges to the observer. Making elusive mobility observable requires a lot of work. An example I studied previously concerns the early twentieth-century tracking of migratory birds. Around 1900, German ornithologists set up large-scale ringing research with hooded crows, black-headed gulls and white storks. While such research relied on low-tech rings, it also required intricate social networks alongside the entire flyways of the birds - which in some cases stretched from Scandinavia to Southern Africa.³³ Over the following decades, the socio-technological constellations enabling the research of animal migration would change in various ways, notably by integrating all kinds of military surveillance techniques. These included aerial photography, radio-tracking and GPS. Alongside these came technologies of tinkering enthusiasts and wildlife filmmakers such as camera traps and so-called critter-cams (cameras

32 See: Robert Kohler, *All Creatures: Naturalists, Collectors and Biodiversity, 1850-1950* (Princeton: Princeton University Press, 2006); Lynn K. Nyhart, *Modern Nature: The Rise of the Biological Perspective in Germany* (Chicago and London: The University of Chicago Press, 2009); Harriet Ritvo, 'Back Story: Migration, Assimilation, and Invasion in the Nineteenth Century', in: Jodi Frawley, Iain McCalman (eds.) *Rethinking Invasion Ecologies from the Environmental Humanities* (New York: Routledge, 2014), 17-30.

33 Raf De Bont, 'Poetry and Precision: Johannes Thienemann, The Bird Observatory in Rossitten and Civic Ornithology', *Journal of the History of Biology*, 44 (2011), 171-203. See also: Kristoffer Whitney, 'Domesticating Nature? Surveillance and Conservation of Migratory Shorebirds in the "Atlantic Flyway"', *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences*, 45 (2014), 78-87; Etienne Benson, 'A Centrifuge of Calculation: Managing Data and Enthusiasm in Early Twentieth-Century Bird Banding', *Osiris*, 32:1 (2017), 286-306.

attached to the animals themselves, which then purportedly record their own 'home movies').³⁴ Over time, these multiform initiatives of animal tracking gradually became globally coordinated and integrated. A provisional culmination point of such integration is *Movebank.org*, an online platform hosted by the Max Planck Institute of Animal Behaviour that brings together the location of tracked animals from across the globe.³⁵ While new in its digitized form, the historical work of Jürgen Renn reminds us that such initiatives can be inscribed in long histories of assembling global environmental data. Referring to the example of meteorology, Renn argues that such collections have globalized together with science itself, while, in the process, generating a look from afar that understands environmental change on a global scale.³⁶ Similar dynamics certainly have characterized the science of animal movement.

To be sure, the science of animal movement was never just concerned with localizing animals in geometric space. Early on, researchers became interested in the behavioural, physiological and ecological aspects of animal mobility. Furthermore, this broad range of approaches to animal migration was co-produced with various forms of social order. In her current research for the Moving Animals project here in Maastricht, Simone Schleper highlights, for instance, how, since the 1970s, various biologists have assessed the impact of the Trans-Alaska Pipeline on caribou migration. Behavioural scientists and ecosystem ecologists, it turns out, come with highly *different* visions as to whether and how the movement of oil and the movement of caribous can be harmonized in Alaska's northern regions. And Oil companies, unsurprisingly, supported the science that claimed wildlife and oil exploitation could happily co-exist.³⁷

Like animal migration studies, also invasion ecology - a topic currently researched here at Maastricht by Vincent Bijman - also concerns more than monitoring animals' locations. It equally involves understanding

34 Donna Haraway, *When Species Meet* (London and Minneapolis: The University of Minnesota Press, 2008), 249-263; Etienne Benson, *Wired Wilderness; Technologies of Tracking and the Making of Modern Wildlife* (Baltimore: The Johns Hopkins University Press, 2010); William Adams, 'Geographies of Conservation II: Technology, Surveillance and Conservation by Algorithm', *Progress in Human Geography*, 43:2 (2019), 337-350.

35 <https://www.movebank.org/cms/movebank-main>

36 Jürgen Renn, *The Evolution of Knowledge: Rethinking Science for the Anthropocene* (Princeton and Oxford: Princeton University Press, 2020), 278-279.

37 See: Simone Schleper, 'Caribou Crossings: The Trans-Alaska Pipeline System, Wildlife and Stewardship in the Anthropocene', (Forthcoming).

and valuing the presence of species in these locations.³⁸ Yet, while although focussing on animals that move, the approaches of scholars of invasions are traditionally different from those of seasonal migrations. Less interested in *individual* movements *through* space, invasion ecologists focus more on the presence of *species* that are non-native *within* a particular space. Their methods are tied to this interest and range from visual and auditory surveying to trapping and, more recently, environmental DNA sampling.³⁹ Ultimately, such methods aim for an understanding of animals that are 'out of place' - 'nativeness' being the crucial category of invasion ecology.⁴⁰

While invasion ecology, thus, studies how species survive out of their 'natural' and 'native' context (with the goal of *hampering* this survival), zoo biology aims for the opposite. The latter discipline developed in the mid-twentieth century to improve survival and breeding rates of animals in the 'artificial' context of the zoo. The most-acknowledged pioneer of this zoo biology was the Swiss zoologist Heini Hediger, who would lead consecutively the zoos of Bern, Basel and Zürich. On expeditions in French Morocco and the Belgian Congo, he studied how animals moved through the space at their disposal, how they created so-called 'animal streets' ('*Tierstrassen*'), how they occupied territories and how they fled when confronted with danger. He concluded that, far from being free, animals in the wild were 'locked' into almost compulsive behavioural patterns that only concerned limited parts of their territory. Comparable to modernist architects, Hediger believed that by carefully designing zoo enclosures one could offer an animal all the functions it required within a relatively small space. For him, zoo biology could enable the creation of Geoffroy's 'cosmopolitan' animals by condensing their natural territories and projecting them onto the architecture of the urban zoo. His highly popular books on how to do

38 While the discipline of invasion ecology only institutionalized in the 1980s, the study of 'invasive' species can be traced back much earlier, having its roots in nineteenth-century natural history, horticulture and agricultural science. Matthew Chew, *Ending with Elton: Preludes to Invasion Ecology* (Unpublished Doctoral Dissertation: Arizona State University, 2006).

39 See, e.g., Jonathan P. Rose et al. 'Traditional Trapping Methods Outperform eDNA Sampling for Introduced Freshwater Snakes', *PlosOne*, 14:7 (2019) <https://doi.org/10.1371/journal.pone.0219244>.

40 See: Peter Coates, *Strangers on the Land: American Perceptions of Immigrant and Invasive Species* (Berkeley and Los Angeles: University of California Press, 2006).

so were published in German, French and English. They continue to influence zoo practice across the globe until today.⁴¹

Zoo biology certainly contributed to breeding successes, which, in turn, fed into the aura of zoos as tools for conservation. Yet, to perform this role credibly, zoos not only required a science that could enable the movement of wild animals to a zoo context but also, conversely, that could enable the movement of zoo-bred animals back into the wild. Such a science would gradually materialize under the name of reintroduction biology - the discipline interested in the behavioural, genetic, ecological and epidemiological aspects of reintroducing species. With its institutionalization, both the study and practice of reintroduction also globalized in the later decades of the twentieth century. A high-profile example of this globalization is 'Operation oryx', which, in the 1960s, brought together a coalition of the WWF, the Phoenix Zoo, the London-based Fauna and Flora Preservation Society and the Saudi King to create a 'World herd' of the last remaining Arabian oryx, and which, within two decades, managed to release zoo-bred oryx 'into the wild' in Oman in 1982.⁴² Not much later, the International Union for the Conservation of Nature (IUCN) set up its Reintroduction Specialist Group to act as a global clearing house of scientific information, whose guidelines would, from the 1990s onward, stimulate and streamline the reintroduction of locally extinct species across the world. In this way, yet another form of animal movement became the object of an internationally organized knowledge and management system.⁴³

41 E.g., Heini Hediger, *Wild Animals in Captivity: An Outline of the Biology of Zoological Gardens* (London: Butterworths Scientific Publications, 1950); Heini Hediger, *Observations sur la psychologie animale dans les parcs nationaux du Congo Belge* (Brussels: Institut des Parcs Nationaux du Congo Belge, 1951). See also: Matthew Chrulew, 'My Place, My Duty: Zoo Biology as Field Philosophy in the Work of Heini Hediger', *Parallax*, 24:4 (2018), 480-500.

42 William M. Adams, *Against Extinction: The Story of Conservation* (London and New York: Earthscan, 2004), 140-144.

43 Phillip J. Seddon, Doug P. Armstrong and Richard F. Maloney, 'Developing the Science of Reintroduction Biology', *Conservation Biology*, 21:2 (2007), 303-312.

IV.

Scientific research is, of course, only to some extent responsible for how humans understand and value wild animals. Partially in interaction with science, undomesticated animals have entered the realm of popular culture - ranging from their physical staging in zoos, museums and theme parks to their narrative representation in magazines, books, documentaries and tourist folders to their rendition into toys and bedroom posters for children of various ages.⁴⁴ Cultural representations, of course, move more effortlessly than physical bodies. Furthermore, the speed of this movement has certainly accelerated over the past century, witnessing its own form of (uneven) globalization. Western representations and understandings of wild animals have internationalized in what globalization scholars would subsume under the term 'Disneyfication'.⁴⁵ This process sped up in the 1990s, with multinational media corporations such as National Geographic and Discovery Channel consciously focussing on nature as a subject that could smoothly cross cultural and ideological divides.⁴⁶ Yet, the stories that these corporations circulated - typically focussing on charismatic mammals and far-off Edens - were neither new nor ideologically neutral. Apart from nineteenth-century colonial travelogues and early twentieth-century hunting movies, they drew on images promoted by international conservation NGOs - which, from modest beginnings in the 1920s, have developed into professional and multi-million dollar organizations such as the World Wide Fund for Nature.⁴⁷ Simultaneously, they echoed the Edenic visions the global tourist industry has propagated since mid-century in order to sell wildlife safaris to international travellers.⁴⁸ All this already indicates the performative power of global wildlife imageries. Their emotional labour feeds back into the ways humans interact with geographically distant animals, which, in turn, can impact the latter's physical trajectories.

44 The history of twentieth-century animal representations in these various media is too extensive to be reviewed here. This lecture draws on: Gregg Mitman, *Reel Nature: America's Romance with Wildlife on Film* (Cambridge, Mass.: Harvard University Press, 1999); Matthew Brower, *Developing Animals: Wildlife and Early American Photography* (Minneapolis: The University of Minnesota Press, 2006); Jean-Baptiste Gouyon, *BBC Wildlife Documentaries in the Age of Attenborough* (Cham: Palgrave Macmillan, 2020).

45 See e.g., Alan Bryman, *The Disneyization of Society* (London: SAGE, 2004).

46 Cynthia Cryss, *Watching Wildlife* (Minneapolis: The University of Minnesota Press, 2006), 79-121.

47 For instance: Raf De Bont, *Nature's Diplomats: Science, Internationalism and Preservation, 1920-1960* (Pittsburgh: The University of Pittsburgh Press, 2021).

48 Roderick Neumann, 'The Postwar Conservation Boom in British Colonial Africa', *Environmental History*, 7:1 (2002), 22-47; Noel B. Salazar, *Envisioning Eden: Mobilizing Imaginaries in Tourism and Beyond* (Oxford: Berghahn, 2013).

The gaze of global media, NGOs and tourist organizations is certainly lopsided when it comes to wildlife. It privileges a limited number of species, spaces and, indeed, movements. The migration of wild ungulates in the Serengeti, for example, has been turned into an iconic instance of pristine wilderness by an almost endless series of internationally resonating films - ranging from Bernhard Grzimek's *Serengeti Darf nicht Sterben* in 1959 and the BBC's *Life* series in the 1960s (with David Attenborough on the spot) to National Geographic's *Great Migrations* of 2010. International conservation NGOs and tourist associations both stimulated and exploited this global media attention with very tangible results on the ground. In the Serengeti, a national park infrastructure was designed to control various forms of movement: of migrating gnus but also of foreign tourists, of the invasive species they brought and of the local Maasai, who, in several stages, were evicted from the park's grounds.⁴⁹

All this might serve as a reminder that internationally circulating animal representations play into unequal power dynamics. In her work, anthropologist Annu Jalais indeed points to the long-distance power of so-called 'cosmopolitan animals'. Unlike Geoffroy Saint-Hilaire, she uses this term *not* to refer to the animals themselves but to representations *of* the animals that circulate transnationally, which makes them - and I quote Jalais - 'personify [...] the very universalism of a Western particular - that of "wildlife" and its need to be protected.' Taking the example of the Bengal tiger in the Sundarbans, she shows how 'cosmopolitan' representations marginalize the understandings of the people who actually share their living space with tigers and who believe governmental conservation programs have unsettled their long-standing interactions with these animals by making them more aggressive.⁵⁰ Scholars are only beginning to take an interest in how non-humans are caught up in the frictions of the cosmopolitanism described by Jalais. It is already becoming clear, however, that 'cosmopolitan' visions of nature might be more heterogeneous than they appear at first sight,

49 Both the cultural representation and political ecology of the Serengeti is well researched. See, e.g., Roderick Neumann, *Imposing Wilderness: Struggles over Livelihood and Preservation in Africa* (Berkeley: University of California Press, 1998); Benjamin Gardner, *Selling the Serengeti: The Cultural Politics of Safari Tourism* (Athens and London: The University of Georgia Press, 2016); Thomas M. Lekan, *Our Gigantic Zoo: A German Quest to Save the Serengeti* (Oxford: Oxford University Press, 2020).

50 Annu Jalais, 'Unmasking the Cosmopolitan Tiger', *Nature and Culture*, 3:1 (2008), 25-40.

and that 'local' responses are not necessarily limited to resistance but also often take the form of selective appropriation and transformation.⁵¹

Even so, the conclusion remains that, over the past century, a relatively small number of transnational media corporations, NGOs and tourist associations made a limited group of 'charismatic' animals increasingly visible for a global audience. This wide visibility has certainly helped in generating funding and political interest for projects of conservation, zoo breeding and reintroduction. As an ultimate example of Disneyfication, such projects are sometimes even tailored around individual celebrity animals. The best-known case is probably that of Keiko, the captive orca who starred in the Warner Brothers film *Free Willy*, and who, in the late 1990s, became the object of a controversial, expensive and in many ways problematic project of releasing him back into the wild. This story is just another example of how global cultural visibility can affect actual animal movement.⁵²

Yet, of course, not all animals are as culturally 'privileged' as Keiko. While the latter appeared in a blockbuster film about inter-species friendship, many others only figure in the tables of administrative protocol, catalogued as 'alien', 'pest', 'surplus' or 'problem' animals. Such animals are not individualized, let alone given human names. Their movement is not the object of heroic storylines like that of the Serengeti wildebeests. They largely remain invisible in a globalized media culture that hails the natural balance of the pristine wilderness. The practical consequences of this invisibility, however, are as tangible as those of the cultural prominence of Keiko. While the affective storytelling of Hollywood has served particular projects of conservation, culturally-induced *in*-visibility certainly also facilitates various mundane routines of control and killing.⁵³

51 Anna L. Tsing, *Friction: An Ethnography of Global Connection* (Princeton University Press, Princeton NJ: 2005); Ursula K. Heise, *Sense of Place and Sense of Planet: The Environmental Imagination of the Global* (Oxford: Oxford University Press, 2008); Maan Barua, 'Circulating Elephants: Unpacking the Geographies of a Cosmopolitan Animal', *Transactions of the Institute of British Geographers*, 39:4 (2014), 559-573.

52 Kenneth Brower, *Freeing Keiko: The Journey of a Killer Whale from Free Willy to the Wild* (New York: Gotham Books, 2005); Benson, *Wired Wilderness*, 179-187.

53 Scholars have mostly touched upon the cultural invisibility of killing in slaughterhouses, animal shelters and laboratories. Yet, their insights equally apply for the killing that takes place in the context of pest control, wildlife management, measures against invasive species and zoo euthanasia. See: The Animals Study Group, *Killing Animals* (Urbana and Chicago: The University of Illinois Press, 2006); Hibba Mazhary, 'Distancing Animal Death: Geographies of Killing and making Killable', *Geography Compass*, 15:7 (2021), <https://doi.org/10.1111/gec3.12582>

V.

This brings me to the final subject of this lecture: the practices humans have developed to manage and police animal mobilities. The histories of this managing and policing intersect with histories of globalization in two important ways. First, it is clear that throughout the twentieth century the governance of animal movement has increasingly become coordinated at the international level. Second, it has to be noted that policymakers and experts have begun to show a greater awareness of the ways in which the infrastructures of globalization themselves affect animal mobility. Both might require some further elaboration.

Throughout the twentieth century, governments and international organizations have gradually created a whole range of lists, laws and guidelines to regulate the transborder movement of animals. Seasonal migrations were the first type of movement to be singled out for such regulatory regimes. Migratory animals acted as 'biotic linkages' between distant regions and states and, because they were deemed valuable as economic resources or icons of wilderness, their killing became the object of cross-border negotiations. As early as 1916, the US and Canada signed a convention with the aim of ensuring - I quote - 'the preservation of [...] migratory birds as are either useful to man or are harmless'.⁵⁴ Over the following century, several bi- and multi-lateral agreements concerning migratory animals ensued, regulating hunting, fishing and whaling and stimulating the creation of protected areas along flyways, swimways and mammal routes. The most ambitious of these was the so-called Bonn Convention of 1979, the first (and so far only) global agreement that sought to protect migratory animals, conserve or restore their habitats and mitigate the obstacles they meet on their travels.⁵⁵ This, consecutively, generated further monitoring practices, such as the Global Register of Migratory Species, which combines a relational database with GIS maps.⁵⁶

⁵⁴ 'Convention for the Protection of Migratory Birds', in: Mark Cioc, *The Game of Conservation: International Treaties to Protect the World's Migratory Animals* (Athens: Ohio University Press, 2009), 177.

⁵⁵ Cioc, *The Game of Conservation*, passim.

⁵⁶ Klaus Riede, 'The "Global Register of Migratory Species" - First Results of a Global GIS Analysis', in: Dietrich Werner (ed.) *Biological Resources and Migration* (Dordrecht: Springer, 2004), 211-218.

While the Bonn Convention aimed to preserve *some* forms of animal movement, it sought to impede others. One convention article explicitly called for ‘exterminating or controlling’ ‘introduced exotic species’ classified as ‘detrimental’ to migratory animals. And the Bonn Convention was only one of the many international treaties that included a clause on invasive species. One can find similar ones in conventions on free trade, biodiversity, human health and biosafety as well as in agreements on fisheries, ships’ ballast water and civil aviation. In 1997, a consortium of international NGOs set up the ‘Global Invasive Species Program’ to streamline codes of conduct and work out tools for quantifying impacts. The initiators of the program hoped to counteract what they described as an increasingly ‘homogeneous world’. Thus, the unspoken hope was that a globalization of monitoring and management would thwart the globalization of animal species.⁵⁷

In the same period, international bodies of various kinds tried to regulate the global flows of zoo animals. In order to maintain the genetic diversity of threatened species, breeders introduced international studbooks, starting with that of the European bison in the 1920s.⁵⁸ Then, in the 1960s, the actual transport of zoo animals became subject to cross-border supervision when the International Air Transport Association issued Live Animals Regulations concerning the shipping containers used, their temperature and stocking densities. Still later, international rules followed regarding which animals could be traded and who was entitled to trade them. Most significantly, the multi-lateral Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) introduced a system of import and export licenses. All this was accompanied by increasingly elaborate forms of record keeping, databases and identification systems (which ranged from tags to, eventually, coded microchips).⁵⁹ Zoos, furthermore, often perpetuated these monitoring systems when releasing animals into the wild. In the case of the reintroduction of the black-footed ferret, for instance, circular microchip readers were installed around the entrances of their burrows

57 Jeffrey A. McNealey *et al.* *Global Strategy on Invasive Alien Species* (Gland: SCOPE, CABInternational, IUCN: 2006), 6 and 42-46.

58 Raf De Bont, ‘Extinct in the Wild: Finding a Place for the European Bison, 1919-1952’, in: Raf De Bont and Jens Lachmund (eds.) *Spatializing the History of Ecology: Sites, Journeys, Mappings* (New York: Routledge, 2017), 165-184.

59 On the regulations at stake in the present-day zoo: Irus Braverman, *Zooland: The Institution of Captivity* (Stanford: Stanford University Press, 2013), 92-158.

to track their whereabouts.⁶⁰ In short, by the end of the twentieth century, an intricate international system of laws, information systems and technologies was in place to coordinate the global choreography of animal movement - whether this concerned migrations, invasions, the zoo trade or reintroductions.

Simultaneously, and in response to these developments, the infrastructures of globalization have been redesigned with an eye for animal movement - at least in part. To some extent, this was just a matter of optimizing the flow of humans and goods by shielding them off from unwanted animal interference. An example are the fences around US highways that - since the 1970s - had to avoid collisions with large mammals.⁶¹ These fences constitute just one of the technologies that incorporated understandings of animal behaviour and physiology into their design. In the twentieth century, engineers have developed a whole range of barriers to withstand the digging, jumping, swimming, gnawing and wriggling of animals. They range from the electric fences used by wildlife managers since the 1930s and electrobarriers patented in the 1950s to ward off invasive fish to the so-called ‘virtual fences’ that might involve the use of scent deterrents, dogs or even the planting of chili peppers in order to contain wildlife movements.⁶²

Some sites have come to serve as spaces of triage. As Susanne Bauer, Nils Güttler and Martina Schlünder have convincingly shown, this is notably the case for the modern airport. Airports indeed increasingly cater the movement of ‘privileged’ animals such as pets and zoo species for which they establish transit zones and veterinary services. Yet, they also install border control practices (involving paperwork, dogs and scanners) to halt illegal wildlife traffic and invasive pests. Of course, the categorization practices and surveillance technologies regulating such selective movements of animals clearly echo those designed for

60 Dean E. Biggins *et al.* ‘Monitoring Black-Footed Ferrets during Reestablishment of Free-Ranging Populations: Discussions of Alternative Methods and Recommended Minimum Standards’, in *Recovery of the Black-Footed Ferret: Progress and Continued Challenges* (U.S. Geological Survey, Reston, Virginia: 2006), 155-154.

61 Gary Knoll, ‘An Environmental History of Roadkill: Road Ecology and the Permeable Highway’, *Environmental History*, 20:1 (2015), 4-28.

62 Waldo Lee McAtee, ‘The Electric Fence in Wildlife Management’, *The Journal of Wildlife Management*, 3:1 (1939), 1-13; V.C. Applegate, US Patent 2,778,140, filed March 9, 1953, and issued Jan. 22, 1957; David S. Jachowski, Rob Slotow, and Joshua Millspaugh, ‘Good Virtual Fences Make Good Neighbours’, *Animal Conservation*, 17:3 (2014), 187-196.

humans.⁶³ This, however, is not only true for airports. In 2019, physical barriers were erected along both the US-Mexican and the Danish-German borders. The first was a project of the Trump administration meant as a symbol of hard-line immigration policies; the second was initiated by a Liberal-Conservative government in a move to protect Danish intensive pig farming from swine flu spread by wild boars. Both not only relied on similar technologies but also on a similar affective logic - that of asserting symbolic control over a national territory. In both cases, critics have argued the walls will do little to achieve the intended policy outcomes, while they will most certainly disrupt borderland communities and ecologies.⁶⁴

In the design of technologies that regulate animal mobility, environmental concerns have often been absent. Yet, throughout the twentieth century, one also sees interventions with the goal to enable rather than to prevent the movement of wild animals between and across human infrastructures. In 1909, for instance, a Belgian engineer published his design of fish ladders, which would allow for the continued migration of fish in the canalized rivers of his country.⁶⁵ Or, in the 1960s, US wildlife managers developed a system of 'passes' in fences that antelopes could cross, but sheep could not.⁶⁶ In the same period, French hunting groups successfully lobbied to set up so-called 'game passages' (*passages à gibier*) to help wild boar and deer traverse highways.⁶⁷ In the 1980s, such ideas popularized in several Western countries, and a whole range of overpasses, underpasses and culverts were designed to enable wildlife crossings.⁶⁸ These infrastructures tied in with new ideas in landscape ecology that stress the importance of connectivity between habitats and push planners to provide corridors in the otherwise fragmented landscapes of the Anthropocene. The Dutch policy plan of 1990 to create a National Ecological Network echoed this philosophy, as did

63 See, e.g., 'Denmark Completes Contentious Fence Along German Border', Febr. 2, 2019, <https://www.dw.com/en/denmark-completes-contentious-fence-along-german-border/a-51496704>; Steve Best, 'The Cost of a Wall: The Impact of Pseudo-Security Policies on Communities, Wildlife, and Ecosystems', in: Natalie Khazaal and Núria Almiron (eds.) *Like an Animal: Critical Animal Studies Approaches to Borders, Displacement, and Othering* (Leiden: Brill Publishers, forthcoming)

64 Susanne Bauer, Nils Güttler, Martina Schlünder, 'Encounters in Borderlands: Borderlining Animals and Technology at Frankfurt Airport' *Environmental Humanities*, 11:2 (2019), 247-279.

65 M. Sabatier de Lachadenède, 'Les échelles à poissons du système Denil sur la Meuse navigable', *Bulletin Français de Pisciculture*, 30:31 (1931), 185-194.

66 Raymond D. Mapston et al. 'A Pass for Antelopes in Sheep-tight Fences', *Journal of Range Management*, 23:6 (1970), 457-459.

67 Jean Carsignol, *Routes et passages à faune: 40 ans d'évolution* (Bagneux: Sétia, 2006), 12 and 19.

68 *Green Bridges: A Literature Review* (London: Natural England, Commissioned Report NECR181, 2015).

its international counterpart, the Pan-European Ecological Network, launched five years later. Such plans were certainly not uncontested, and the ecological rationale of wildlife movement only partially informed the spatial planning that resulted from them.⁶⁹ Yet, they do testify of a growing reflexivity about non-human movements in the late modern landscape.

While we can see a rise in international initiatives to regulate animal movements by laws, databases, fences and corridors, it is clear that these initiatives never work entirely as planned. The mechanisms used are incomplete and contested. Developers, for instance, can occupy what ecologists deem as wildlife corridors. Activists can challenge the killing of invasive species. Wildlife traders can circumvent international regulations. And, of course, the behaviour of animals themselves often defies existing scientific theories, media expectations, and management plans. Invasive brown tree snakes circumvent border control. Caught Sumatran rhinos fail to breed in captivity. Deer skip through fences and run into cars.

Despite increased study, interest and surveillance, the movement of wild animals across the world clearly remains unruly and messy.

69 Henk van den Belt, 'Networking Nature: Or Serengeti behind the Dikes', *History and Technology*, 20:3 (2004), 311-333.

VI.

How to conclude? Is there something that ties these chaotic phenomena of human-animal interactions together? Is there ultimately a more-than-human history of globalization to be written?

There are probably various ways to conceptualize such a history. One productive way might be to think of globalization as the development of what I would call 'world naturecultures'. This term, of course, is a blend of 'world culture' (a notion often used in globalization literature) and the aforementioned Latourian concept of 'naturecultures'.⁷⁰ Given that these two notions stem from diverging intellectual traditions, the meaning of the merged concept 'world naturecultures' might need some further clarification. First, there is the Latourian component, naturecultures, which implies that the human and the non-human are always entangled. Undomesticated animals, to return to this topic, are part of these entanglements. They live in a world of highways, fences, containers, databases and laws, genetic samples and Disney films. Their lives are enmeshed in a web of relations with humans and human-made things. Such relations, however, are subject to change. The examples I have drawn on in this lecture seem to suggest that over the past century and a half there has been an acceleration in and a growing concentration of connections, and that these connections expand over increasing distances - hence the construction of '*world naturecultures*'. The transcontinental movement of oryx, for instance, is enabled by a globally integrated database and by international airlines. The dispersal of Khapra beetles is fuelled by container shipping, while it is also partially kept in check by international guidelines and multilateral policy agreements. And finally, a disease found in bats and pangolins in the Chinese province of Wuhan affected humans across the world within the time span of a few months.

⁷⁰ The term 'world culture' antedates the globalization literature of the 1990s by a long time. It was, for instance, famously used in the pamphlet, UNESCO: *Its Purpose and Philosophy*, by the organization's first secretary-general, Julian Huxley. In the 1990s, it would be particularly picked up amongst neo-institutionalist sociologists interested in globalization. See e.g., Julian Huxley, UNESCO: *Its Purpose and Philosophy* (London: Preparatory Commission of the United Nations Educational, Scientific and Cultural Organization, 1946), 61; Frank J. Lechner and John Boli, *World Culture: Origins and Consequences* (Oxford: Blackwell Publishing, 2005). On Latour's position in the wider nature-culture scholarship: Owain Jones, 'Nature-Cultures', in: Nigel Thrift and Rob Kitchin (eds.) *International Encyclopaedia of Human Geography* (London: Elsevier, 2008), 209-323.

Yet, the examples used in this lecture also indicate that we should *not* think of the development of 'world naturecultures' as a process that is monolithic and all-encompassing. The networks discussed might be transcontinental, but they clearly do not reach all the corners of the Earth. These long-distance connections, furthermore, are implicated in a complex set of (often-contradictory) processes. Conservation and wildlife trafficking, to mention just one example, both rely on global networks, but the flows of animals they enable are of a fundamentally different kind.

The globalization of naturecultures is not only heterogeneous in character, but it also brings forth uneven results. Like cultural globalization, it seems to generate both sameness *and* difference.⁷¹ On the one hand, transcontinental phenomena such as conservation biology, the National Geographic Channel or Live Animals Regulations streamline representations of and interactions with animals across the globe. Global infrastructures, furthermore, contribute to the spread of particular animal species - thus bringing about biological 'sameness'. On the other hand, however, long-distance connections also help to maintain or even restore local particularities. The latter is true, for example, for the reintroduction of the Przewalski's horse in Mongolia - a case currently researched here in Maastricht by Monica Vasile. Extinct in its native habitat for almost thirty years, the species was brought back in an operation that drew on, amongst other things, semi-reserves in the Dutch polders, studbooks held at the Prague Zoo, Aeroflot airplanes from Russia, radio-trackers designed at the Smithsonian Institution, and a few dozens of horses bred in zoos across the world. Yet, while clearly a transcontinental endeavour, the reintroduction also strengthened the *national* symbolic value of the Przewalski's horse and helped to set the Mongolian steppes apart from other grassland areas in the world.⁷²

'World naturecultures' are, in the end, always partial and fragmented. While canals contribute to the mobility of some species, they halt that of others. While BBC documentaries make some animals globally visible, they keep others from sight. And while global breeding schemes target certain groups within the animal kingdom, others go silently

71 With regard to cultural globalization this argument is made, for instance, in: Arjun Appadurai, *Modernity at Large: Cultural Dimensions of Globalization* (Minneapolis, MN: University of Minnesota Press, 1996).

72 For an insider's story, see e.g. Piet Wit and Inge Bouman, *The Tale of the Przewalski's Horse: Coming Home to Mongolia* (Zeist: KNNV, 2006).

extinct because globalization's division of labour interferes with their habitat. A more-than-human history of globalization is, thus, necessarily variegated. It is sensitive to differences across species, populations and individuals.

Through these variegated histories of the twentieth century, one can clearly see signs of an increasing human awareness of animal mobilities. Often, this awareness is part of modernist ambitions of surveillance and control.⁷³ Yet, I think the past also offers more optimistic stories of people who experimented with ideas, practices and technologies to attune human and non-human movements in a shared choreography.⁷⁴ Eco-ducts have appeared across highways, fish ladders along dams, and antelope passes in sheep-tight fences. Surely, these phenomena have to be situated in the margins of the logistics of the global economy, but they can prove inspirational. As such, they can provide us with a place to start from in reflecting on which naturecultures we want for the future.⁷⁵

73 E.g., Raf De Bont, 'Hamster Numbers: Biopolitics and Animal Agency in the Dutch Fields, 1870-Present', *History and Philosophy of the Life Sciences*, 43:50 (2021) <https://doi.org/10.1007/s40656-021-00398-3>.

74 See in this context, for instance: Jonathan Metzger, 'The Moose are Protesting: The More-than-Human Politics of Transport Infrastructure Development', in: Jonathan Metzger, Philip Allmendinger and Stijn Oosterlynck (eds.) *Planning against the Political* (New York: Routledge, 2014), 303-226; Maan Barua, 'Infrastructure and Non-Human Life: A Wider Ontology', *Progress in Human Geography*, (2021) doi:10.1177/0309132521991220.

75 For an overview of current ideas to integrate non-human nature into design and planning processes (particularly in an urban context), see: Timothy Beatley, *Handbook of Biophilic City Planning and Design* (Washington: Island Press, 2016).

VII.

Ladies and gentlemen,

As you all know, the most wonderful part of Dutch inaugural lectures comes at the end: the words of thanks. In the academic world, it does not come closer to an Oscar ceremony than this.

Let me start by thanking the Rector, Rianne Letschert, the members of the Executive Board of Maastricht University as well as the Board of my own Faculty of Arts and Social Sciences for their role in establishing this chair in the History of Science and the Environment. In particular, I would like to thank both our past and current dean for the confidence and support. *Dankuwel*, Sophie. *Danke schön*, Christine.

Nu ik toch talen aan het verhaspelen ben, ga ik graag nog even door in het Nederlands.

Technisch gesproken zijn academici natuurlijk ook een soort van bewegende dieren. Mijn eerste habitat bevond zich in Leuven. Ik leerde daar erg veel aan het Geschiedenisdepartement - gedeeltelijk ook over geschiedenis. Er zijn veel mensen om te danken voor de prettige herinneringen. Ik vermeld hier graag Jo, Kaat, Tom, Liesbet, Rajesh, Elwin, Jolien, Joris.

Na Leuven vond ik een andere ecologische niche in Maastricht. Al geef ik toe dat de kennismaking aanvankelijk een beetje desoriënterend was. Het leven was er 'probleemgestuurd' en het organigram gebaseerd op *The Matrix*. Al snel echter ontdekte ik dat achter die matrix-structuur een groep schuilt die inclusief, warm en stimulerend is. Er zijn te veel collega's om te danken binnen en buiten MUSTS en het geschiedenisdepartement. Ik zou in het bijzonder de clubleden van het Moving Animals project willen vermelden, Cyrus, Jens, Monica, Simone en Vincent, en daarnaast mijn kantoorgenoot Geert 'goeie s'morgens' Somsen, en mede-Antropocenoloog Vincent Lagendijk. Valentina en Cyrus dank ik graag om mee te denken over deze oratie.

Ik dank graag mijn ouders. Niet alleen omdat ze tijdens de jaarlijkse vakanties van mijn kindertijd telkens plaats maakten voor een bezoek aan minstens één (soms wat bouwvallige) dierentuin, maar vooral om te zijn wie ze zijn.

Ik dank Nand en Linus om hun vrolijkheid, onstuimigheid en enthousiasme. En ook om af en toe met mijn grappen te lachen.

En tot slot dank ik Greet voor alle afgelopen jaren (en, met enige voortvarendheid, meteen al voor alle jaren die nog komen). Om het met Morrissey te zeggen: *The pleasure, the privilege is mine*.

Ladies and gentlemen,

We live in an interconnected world, and sometimes, *alas*, the interconnections take the form of global pandemics. The current one has interfered with the planning of this lecture several times, but I am happy it has not prevented you from being here today. I think you all more than deserve a drink now!

Ik heb gezegd.

