Introduction:
Infrastructure and the Animal

Thomas White and Emilia Sułek

In 1865 the Union Stock Yards opened in Chicago. This stockyard complex – the largest of its kind in the world – was financed by nine railroad companies, and became the key hub enabling the livestock of the American West to be rendered into commodities which were then transported by railroad to consumers in the country's eastern cities, and beyond. In his classic work, *Nature's Metropolis* (1991), the environmental historian William Cronon, writing before the crystallisation of infrastructure studies, called attention to the way animal lives were transformed by the railroad so that they became "abstract, standardized and fungible" (Cronon 1991: 259) across vast geographical distances. At the same time, the railroads that transported livestock across the USA also contributed to the disappearance of the wild bison, on which the Indigenous Peoples of the Great Plains depended, with sport hunters even gunning down the animals from the windows of moving trains. The railroad companies were more than happy to facilitate such pursuits, since bison wandering onto the tracks could cause significant disruption to the circulation of people and goods.

Why think of infrastructure in relation to nonhuman animals? The parallel emergence in recent years of the infrastructural and animal 'turns' in the social sciences does not in itself constitute a sufficient rationale for the juxtaposition enacted by this edited collection. However, our opening vignette suggests how the transformations in human–animal relations characteristic of modernity might be analysed in relation to the development of infrastructure. For the art critic John Berger (1980: 3), modernity heralded the marginalisation of animals, before which they had "constituted the first circle of what surrounded man." That we as authors, writing from cities in the UK and Switzerland, rarely encounter animals in our daily lives unless they are in plastic-wrapped pieces at the supermarket, is due to the fact that various infrastructures exist allowing animal lives and deaths to be processed out of sight (and sound, and smell). At the same time, in many parts of the infrastructure-saturated world, one of the main ways in which humans encounter wild animals involves their death as roadkill (Rigby and Jones 2022), and their abandonment at roadsides: marginalisation in a most literal sense.

Camel on road, Inner Mongolia, China.
Photo: Thomas White.

By drawing on a variety of ethnographic contexts, the contributions to this special issue question this equation of animal marginalisation and infrastructural modernity. And rather than thinking merely of what infrastructures do to animals, the contributors to our collection also reveal what animals do to and with infrastructures. In the process, they develop a conversation that has recently emerged among anthropologists and geographers on the entanglement of infrastructures and nonhuman life (e.g. Morita 2017; Barua 2021; McClellan 2021). In what follows, we propose why thinking with animals can be productive for scholars of infrastructure.

Anxieties of Circulation

Infrastructures, as "the architecture for circulation" (Larkin 2013: 328), are today central to the commodification of animals, and parts of animals, enabling the consumption of meat, for instance, to be removed in time and space from the visceral reality of slaughter. Yet the infrastructures that allow animals – parts and whole – to travel around the world are not just those of transportation; instead, the ability of animals to host viruses means that complex biosecurity infrastructures have emerged which seek to enable the movement of animal flesh, but prevent that of viruses (Blanchette 2020). In her contribution, Jiraporn Laocharoenwong shows how the extensive infrastructure that enables the transnational circulation of animals as commodities across the Thailand–Myanmar border, and onward to China, is dependent on the mundane work of care performed in privately run quarantine stations, often by migrant labourers.

The circulation of parts of animals afforded by infrastructure can also enable unwanted substances to enter the food chain. In Kyrgyzstan, where new roads have been constructed under the auspices of China's Belt and Road Initiative, Emilia Sułek describes local fears that *haram* donkey meat is being served at roadside restaurants – the byproduct of a wave of donkey rustling alongside Chinese-built roads to provide hides for the Chinese pharmaceutical industry.

Such fears exemplify the ambivalence with which infrastructural connectivity is often received on the ground, notwithstanding the modernist "promise" of infrastructure (Anand et al. 2018). Roads in particular can be regarded negatively as "a passageway for strangers" (Humphrey 2015: n.p.) or even the home of deadly spirits (Masquelier 2002). In rural Tibet, as described by Maria Coma in her article here, new roads not only make it easier to sell livestock for slaughter, but have also made this commodification more visible. In the context of deep ambivalence on the part of local Buddhist herders towards such commodification, roads have become "fraught spaces where the dilemmas of marketisation are made tangible."

Design for Life

One of the central insights that emerges from ethnographic considerations of infrastructures is that they do not always work as smoothly as their designers intend. Infrastructures, as complex assemblages of degrading materials, are subject to breakdown and disrepair (Schwenkel 2015; Joniak-Lüthi 2020). If studies have thus foregrounded questions of materiality, there has been less attention to the ways in which the liveliness (and lifelessness) of animals poses problems for those who design and manage infrastructure. The issue of roadkill, for example, suggests that questions of maintenance and decay in infrastructure studies could fruitfully be expanded beyond the material infrastructure itself to include the work that goes on in its immediate environment, such as dealing with the bodies of animals killed on roads. Gabriel Roos, in his article, reveals that in Switzerland such animals exist in a legal grey zone, with the result that the manner in which carcasses are disposed of depends largely on the decisions of individual gamekeepers.

On the way to the animal market, Osh-Bishkek highway, Kyrgyzstan.
Photo: Emilia Sułek, 2022.

In recent decades the scientific field of road ecology has emerged to study the ecological effects of linear infrastructure, and to propose solutions that seek to reconfigure the relationship between animals and infrastructure (see White 2020). Rather than simply fencing off infrastructures (and thereby disrupting animal mobilities), roads and railways now often feature underpasses or 'wildlife bridges' in their designs, a trend that Jonathan Metzger (2014: 208) has referred to as "more-than-human planning." In his contribution to this collection, Maan Barua suggests that such "reconciliation infrastructures" represent a shift in the biopolitical logic of conservation from confinement in protected areas to the modulation of nonhuman mobilities. While such infrastructures embody hopes for "a form of ecological peace, a settled frictionless order," Barua demonstrates how they can also reinstantiate forms of dispossession which have long accompanied conservation projects, as nonhuman mobility is privileged over the concerns of local farmers.

Reconciliation infrastructures also raise questions of epistemic politics. In her article, Simone Schleper discusses the case of the Trans-Alaska Pipeline System (TAPS), where caribou have come to be treated as a key indicator of ecosystem health. The apparent ability of caribou to become habituated to this infrastructure, evidenced in striking photographs which juxtapose the huge pipes with mothers and their calves, obscures other detrimental ecological effects of the TAPS. The "charisma" of certain species (Lorimer 2007) can thus become part of the "spectacle" of infrastructure (Schwenkel 2015).

Some infrastructures, however, unwittingly enable the flourishing of particular species, as these animals repurpose infrastructures in ways that are not accounted for by their human designers (Barua 2021). Drawing on archival research, Jack Greatrex shows how extractive infrastructures of British colonialism in Malaya facilitated the unwelcome movement of locusts, as well as constituting a habitat for these insects through the novel, recombinant ecologies that emerged along the sides of roads and railways.

Animals as Infrastructure

In various contexts across the world, nature is increasingly understood in infrastructural terms (Carse 2012; Wakefield 2020). Some of the articles in our collection suggest that this mode of infrastructural thinking might enable the emergence of new forms of urban cosmopolitanism, as people learn to live alongside, and even value, certain animals once classified as pests. Nevertheless, this hospitality remains one which privileges human management of the Earth (van Dooren 2016), even if it relinquishes some of the modernist desire for control and the purification of nature and society (Latour 1993).

Ognjen Kojanić discusses how the proliferation of golden jackals on the outskirts of Belgrade is represented in the media as a problem of irresponsible citizens who fail to properly dispose of their rubbish. Yet such representations obscure systemic issues with waste infrastructure in the city; instead, Kojanić suggests that alternative descriptions of these animals as helpful "hygienists on duty" indicate the possibility of a "multispecies infrastructure of waste." Such potential is beginning to be recognised in some cities. Drawing on research in Amsterdam, Herre DeBondt and Rivke Jaffe describe transformations in the way rats are understood: from unhygienic "epidemic villains" (Lynteris 2019) antithetical to urban modernity, which had to be removed from sight by waste infrastructure, to useful "waste workers" who consume the "fatbergs" that can block sewage pipes.

Of course, animals have long lived alongside humans because they worked alongside humans. However, the railroads that began transporting animals as flesh eventually led to a decline in many parts of the world in the use of animals as transport; indeed, the obsolescence of animal power, and its replacement by transport infrastructure, is central to narratives of progress. But the global distribution of such infrastructure is uneven. At many "infrastructural frontiers" (Schouten and Bachmann 2022), where paved roads give way to rough terrain, working animals continue to be important, both economically and politically. In northern Myanmar, as explained by Jacob Shell's piece, elephants play a significant role in amber prospecting and extraction, while also enabling forms of "subversive mobility" (Shell 2015) which keep the state at bay. As climate change renders infrastructures across the world increasingly vulnerable to the dynamic materiality of terrain, confident teleologies of animals and infrastructural modernity might have to be rethought.

photograph, David Hawkins for his copy-editing as well as Chantal Hinni for the visual side of this special issue. Last but not least, we would like to express our gratitude to the editorial board and, particularly to Tina Harris and Agnieszka Joniak-Lüthi, for their enthusiastic support throughout the editing process.

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Cite as:

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