Anthropocenes
HUMAN, INHUMAN, POSTHUMAN

Cottyn, H., et al. (2023). Life Out of Place: Revisiting Species Invasions. Introduction to the Special Issue. *Anthropocenes – Human, Inhuman, Posthuman*, 4(1): 1. DOI: https://doi.org/10.16997/ahip.1433

COMMENTARY

Life Out of Place: Revisiting Species Invasions. Introduction to the Special Issue

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This introduction begins at the Bruges 2018 Triennial *Liquid City*, where the research and design collective Rotor, the Ghent Centre for Global Studies, and Anna L. Tsing organised an interdisciplinary workshop on the trajectories of displaced species. Looking back to the collaborative reflection that emerged during the workshop, and the pandemic since, this special issue recalls invasive species from within the broader field of multispecies research. It proposes a relational, entangled approach to expose and examine the contradictions and instabilities that shape the more-than-human entanglements through which humans recasts certain non-humans as 'invasives'. Interweaving the journeys of crabs, moles, rabbits, and fungi in and out of human-designed worlds, this article formulates three sets of guiding questions for the special issue. Our questions inquire into the conceptual and scientific frameworks, the material infrastructures, and the repertoires of human reactions to disturbances, exposing how species invasion initiates relations of correspondence that exceed categories of 'invasiveness'.

Keywords: invasive species; multispecies research; invasiveness; infrastructures

1. Thinking with Crabs at the Bruges Art Triennial: A Contamination Event

Built at the turn of the 14th century, 'De Poortersloge' (the Porters Lodge) in Bruges, Belgium, was the meeting place for mediaeval merchant families who lay the foundations of international free trade by water. In May 2018, the same *Poortersloge* building – today an exhibition space for contemporary art – was the location for a workshop with Anna L. Tsing on the trajectories of displaced species, which constitute the protagonists of this special issue. The workshop, titled 'The Crab at the End of the World? On Invasive Species, Salvage Economies and the Arts of Living on a Damaged Planet' was organised by Rotor and the Ghent Centre for Global Studies in the context of the Bruges Art Triennial. The edition of the art festival was coined *Liquid City*, a theme borrowed from sociologist Zygmunt Bauman's book *Liquid Modernity* (2000) in which change is the only permanence, and the flexibility and fluidity of impermanence a burgeoning characteristic of modernity.

The workshop brought together a group of researchers, practitioners, and students in anthropology, architecture, history, and political sciences to explore the political-epistemological implications of thinking with the notion of 'species invasion'. The forty or so participants of the workshop engaged with the complex travels of critters through lively plenary discussions, a walk alongside the Bruges canals, a visit to a unique, privately-run archival collection dedicated to human-animal interaction (Mendop[1]), and a live performance about the fate of a South American freshwater snail in Taiwan. Significant for the workshop were the unsuspected inhabitants of the waterways of historical merchant transactions.

The point of departure for this collective interrogation was the work of the Brussels-based research and design group Rotor that was built around a specific crab species. Rotor's installation 'What's Eating the Chinese Mitten Crab?' presented a micro-museum on the complex story of the Chinese mitten crab (*Eriocheir sinensis)*, a non-native fresh-water crab species, originally from the Yangtze River Delta in China (now dispersed all over fresh-water bodies from California to Western Europe, and even in the world-famed Bruges canals). The show included exhibits ranging from a model of a warship from the German Imperial Navy, over calligraphed Chinese poetry, to live crab specimen caught in the Bruges canals, and newspaper clippings from the early 20th century attesting to their long-time presence in Bruges and attempts to regulate their population numbers. These elements were all fittingly exhibited in the same *Poortersloge* in which the workshop took place.

The different contributions brought together in the workshop examined more-than-human entanglements

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with species that thrive *out of place*. Such entanglements do not belong to particular places; they plot unstable trajectories that establish new, often unexpected spatial connections. Yet interestingly, the trajectories of the species discussed at the workshop all shared a tangible relation with Bruges, or Belgium more broadly. The mitten crabs exhibited in the aquariums for the Rotor exhibition were even caught from the historic waterways surrounding the workshop. During the workshop, the fungus-like *Phytophthora infestans* was summoned. It triggered the 1845 European potato failure, with first sights of late blight reported in potato fields in the province of West-Flanders, that Bruges is the capital of. The rabbit too, *Oryctolagus cuniculus*, was followed on its tour around the globe, with its largest breed today maybe not uncoincidentally the "Flemish" Giant. Also present at the workshop was the knotweed plant (*Fallopia japonica)*, particularly the fragments of its rhizome roots that are transported through Brussels via construction site soils.[2] Another invasive species participating in the discussions was Fusarium wilt, whose scientific and agricultural control is highly dependent on the world's largest banana gene bank hosted at Belgium's oldest university.[3] The coming together of these species' different trajectories went some way in unsettling the contours of rigidly maintained nation-states, situating Belgium within a wider context of cross-continental entanglements.

On the last evening of the workshop a further invasive critter was introduced, in the first public performance of the Golden Snail Opera, held at the Concertgebouw cultural centre in Bruges. The golden snail (*Pomocea canalicuata*) is a water snail that was imported to Taiwan from Argentina in the 20th century as a source of food but was not met with great appetites. Instead, it spread across Asia, threatening wetland ecologies and rice farming practices. Unlike native snail varieties, the golden snail delights on young rice shoots. Partly filmed by a camera carried by a giant African snail, images on a screen are combined with a live reading of three scripted parts performed by Anna L. Tsing, Isabelle Carbonell, and Karen Ho. Tracing divergent more-than-human relations in the trail of the invasive snail, the performance resonated with the discussions held at the workshop and developed in this issue about species' unexpected journeys when venturing into new landscapes. Taiwanese farmers push back against the golden snails: some hand pick them off their crops, others resort to poison, while ghosts and deities are also summoned to deter them.

The life stories of invasive species prove to be a fertile ground for interdisciplinary research and dialogue. With practices ranging from architecture to rural history and environmental anthropology, the contributors to the workshop and this special issue rely on their diverse backgrounds to interrogate these life stories. Across this diversity they share an interest in engaging a multispecies approach to crack open narrow framings of phenomena such as invasive species as either 'environmental' or 'human' (O'Gorman & Gaynor 2020: 711). Such an approach sheds new light on seemingly familiar stories, shifting our attention to the contradictions and instabilities that shape the more-than-human entanglements through which certain species emerge as invasives. In different ways, the authors dip into multispecies ethnography, more-than-human history, inhuman geographies, animal studies, post-humanist philosophy and other subfields of environmental humanities, without necessarily being experts in those fields. It is probably the freshness of the topic which made it possible for scholars with different disciplinary backgrounds to come together around this topic for this *more-than-academic* event in Bruges, Belgium.

2. An Ongoing Conversation: Multispecies Encounters

In the years following the workshop, the question of interspecies entanglement – particularly of humans' capacities for living in and with a more-than-human world – has become more urgent. During the first months of 2020, the very personal experiences of the global pandemic alongside scientific attempts to track the movement of the virus around the globe sought to make sense of the spread of the COVID-19 virus. Epidemiologists have pointed to the increasing and planetary-wide mobility of humans as well as their concentration in growing urban centres, the ever-larger stakes of maintaining their livelihoods in ever globalising commodity markets, and the related intensification of human interventions in natural ecosystems (Thoradeniya & Jayasinghe 2021; Liu 2020). The latest pandemic also made visible the hugely paradoxical relationship humans have with invasive species. Begging the question: 'Who is the invader?' (Elton 1958). While this remains scientifically contested, in fact we – *Homo sapiens* – could be considered invasive alien species number one on this planet (Marean 2015; Dennell 2017).

Still primarily the terrain of ecology scientists, invasive species studies are increasingly opening up an avenue of new environmental humanities and multispecies research (Heise, Christensen & Niemann 2017; Helmreich 2005). As these interdisciplinary fields gradually consolidate, a host of sub-fields, interested in urgent questions around interspecies disturbance and entanglements, have emerged. Extinction studies (Rose, van Dooren & Chrulew 2017; Büscher 2021), a new interest in species domestication (Swanson, Lien & Ween 2018), ferality (Tsing et al. 2020), and invasion (Frawley & McCalman 2014) problematise seemingly straightforward processes as neither natural nor neutral. The reappropriation of categories from the natural sciences to study non-human life has fostered a reassessment of how and why certain species have escaped or eschewed attempts at human control, and to what effects. By reclaiming the study of these phenomena as philosophical questions, multispecies research forces us to deal with the discomforts of multiplicity and open-endedness.

In a response to biological invasion's apolitical framing, Robbins suggested in 2004 to reorient the focus away from species as protagonists, and to consider not species, but 'power-laden networks of human and non-human actors' as being invasive (2004: 3–4, 140). Around the

same time, Larson explicitly pleaded to bring humans back into the study of these multispecies events, to prevent invasive species from being treated 'as merely a scientific issue' isolated from their social context (2007). In the following years, multispecies studies has established itself as an interdisciplinary and collaborative field that centres attention on relationships rather than on particular lives, places, or perspectives (van Dooren, Kirksey & Münster 2016: 3–4; The Multispecies Editing Collective 2017). Contrary to some suspicions that multispecies research implies a disregard of social justice concerns, recent research explicitly demonstrates that examining nonhuman responses to human designs can offer a lens to uncover the political dimensions and unequal structures behind, seemingly neutral, biological processes (Tsing, Mathews & Bubandt 2019: S188).

As a domain that exceeds anthropological inquiry, multispecies research is particularly relevant in interrogating invasiveness for its relational and entangled approach. It highlights key questions, that tend to get lost in natural sciences, regarding the deeply unequal, capitalist, and colonialist power relations that have shaped (but also concealed) humans' assumed exceptionalism. In times of unprecedented environmental crisis linked to intensifying anthropogenic habitat destruction, gaining insight in the dynamics of invasive species' life stories becomes even more relevant. Whether spreading rapidly or slowly, triggering intense or subtle disruptions, these dynamics can cause the total transformation of landscapes. Geologists are even looking to signs of invasive species written into the rock record as biostratigraphical markers to date the start of the Anthropocene as a new geological epoch (Zalasiewicz et al. 2019). The coronavirus has amplified multispecies thinking over the last few years, as evidenced by The Coronavirus Multispecies Reading Group (Kirksey & Vaughn 2020).

Looking back to the collaborative reflection that emerged during the 2018 workshop, and the pandemic since, this special issue recalls invasive species from within the broader field of multispecies research. The collection accompanies a set of omnipresent, yet rarely sighted critters on their journeys in and out of human-designed worlds. The essays develop a close examination of the situated histories of the crabs, fungi, and rabbits. Included in this special issue, although not discussed at the workshop, are the encounters between moles and archaeologists which took place in the underground of a medieval settlement in the countryside of Bruges. Closing with Anna L. Tsing's afterword, this collection draws attention to the unexpected outcomes of the human, temporarily, and spatially-situated attempts to create controllable environments.

Thereto, it proposes an entangled, global, and historical perspective for processes of species invasion. It explores possible ways to move beyond an anthropocentric approach that tends to codify multispecies entanglements as mere chemical and energetic exchanges. Invasive species are the subject of humans' political and ethical practices of labelling, ordering, and (il)legitimising forms of life (van Dooren 2011). At the same time, they act as proxies for human-induced change. Even deliberately introduced species are likely 'to undermine complacent assumptions about human control' (Ritvo 2012). They manifest how any investigation into the more-than-human necessarily entails an interrogation of how we define the human. Just like any other classification of life, the category 'human' tends to conceal that humans are not just bodies nor a homogeneous subject but situated beings within the web of life, tangled up in racialised, gendered and classist power relations.

The following essays provide empirical and theoretical insight into how invasive species challenge conceptual frameworks and material infrastructures by initiating relations of correspondence that exceed categories of invasion, nuisance, or pest. Starting from the encounters of ostensibly *invasive* species with human designs, we allow these species a greater degree of protagonism. We take the journeys of invasive species as points of entry from which to interrogate the current planetary anthropogenic and capitalist disturbance, which social scientists have started to refer to as the Anthropocene, or variations, such as the Capitalocene, the Plantationocene, or the Chthulucene (Tsing, Mathews & Bubandt 2019; Tsing et al. 2020). We trace their trajectories over a span of centuries, starting with European colonisation, as well as recounting encounters that developed over the last decade. Yet, it is not the *species* themselves that take centre stage but the new relationships they bring about in a shared environment with other species. We explore invasive species' life histories in terms of 'multispecies encounter', regardless of the scientific soundness of the categorisation of some of these critters, such as the mole, as invasive. A reorientation towards the active non-human participation in Anthropocene reconfigurations can unveil the multiple, non-linear, and often contradictory character of more-than-human world-making in a context of anthropogenic and capitalist crisis. As unlikely protagonists of the Anthropocene, invasive species re-appropriate and re-shape, in various ways, the ruins of capitalism.

From such a perspective, freshwater crabs appear simultaneously as omnivorous acrobats feeding on the bottom of European waterways and as delicacies in Asian cuisine. Invisible fungi appear as apocalyptic destroyers of global staple foods when finding their way to monocultures. Rabbits, shy and homebound by nature, reveal their talent for territorial conquest, travelling wide across continents and deep into cultural representation. Moles come forward as invasive world-makers of another kind, outside scientific invasive species lists but thoroughly affecting the productivity of gardeners, farmers, and archaeologists. Interrogating how this non-human life confronts societies with new and unforeseen consequences and challenges, this special issue explores a variety of human reactions to invasive species ranging from extermination, and efforts to stop the spread of certain critters, to attempts to turn their unwanted presence into new opportunities, yet often resulting in the incapacity to control the complex lifeforms of invasive species.

We identify three sets of key questions that explore the power relations at play in these more-than-human entanglements in this introduction. Our questions particularly address the conceptual frameworks through which humans attempt to bring order, the disturbances of anthropogenic conceptual and material structures, and human responses to those disturbances. These sets of questions guide this special issue through tensions between order and flux, design and unintentionality, coexistence and eradication.

1) *The categorisation of life as 'out of place': When and where does something become 'invasive', a 'pest'? When or where does it cease to be?* This special issue ties in with new directions in research on invasive biology that inquires how 'categories do things and sustain structures' (Cattelino 2017: 132). Inquiring particularly into the role of science, it seeks to broaden *invasiveness* to a question of how labels are constructed to make sense of complex multispecies relations.
2) *The subversion of capitalist projects: What does invasion do? Who or what is invading?* Invasive trajectories provide a productive avenue to explore how infrastructures are constantly destabilised by more-than-human agencies. Invasive trajectories disturb established chronologies and geographies too. The spatio-temporal dynamics of how species are considered to end up *out of place* are not innocent, but reflect the unfolding of colonial, imperial and capitalist projects.
3) *The repertoires of human reactions to invasive species: What worlds do we make?* Through science, political economy, and environmental management, societies have responded to unexpected outcomes of the transformation of ecosystems. These reactions range from redirecting, aborting, or sometimes rather sustaining invasive trajectories.

The introduction ends with a reflection on transdisciplinary methods to unearth, describe and engage with these complex trajectories.

2.1. Interrupting categories

Recasting processes of domestication, ferality, extinction, and invasion within a more-than-human world draws attention to the *work* done by categories. The notion of a 'species' is often relied upon as a concrete step in simplifying human-nature entanglements of certain human interests in, and valuations of, non-human life (Hustak & Myers 2012). Because this notion can conceal the moulding of non-human life by human framings, 'species' is sometimes even referred to as 'a stagnant and apolitical category of difference' (Ogden 2018: 63). Similarly, the specific invasive, domesticated, or extinct qualities assigned to species are the product of anthropocentric conceptualisation and management practices. These assumedly self-explanatory categories are performed and justified, and at times institutionalised, through scientific *discovery* and classification, environmental regulations, and easily digestible narratives (Lidström et al. 2015; Clark 2015; van Dooren 2011; Mitchell 2016). 'Invasive species' are a case in point. The US government defines an invasive species as an organism that is 'non-native (or alien) to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health' (USDA n.d.). The European Commission similarly identifies 'Invasive Alien Species (IAS)' as:

> ...animals and plants that are introduced accidentally or deliberately into a natural environment where they are not normally found, with serious negative consequences for their new environment. They represent a major threat to native plants and animals in Europe, causing damage worth billions of Euros to the European economy every year (EC Directorate General for Environment. s.d.).

The above definitions reduce certain plants and animals to the damage they may cause to humans and their economy. Short of including humans in the definition, these framings suggest the possibility of expressing non-human life stories in monetary terms (Schrader 2012). In that way, the US and European Commission's policies offer an illustration of how species categories are operationalised and institutionalised as 'abstractions designed to simplify the concrete profusion of life' (Mitchell 2016: 33).

As Harriet Ritvo stresses, there is a need to 'acknowledge the instability and ambiguity inherent in both elements of the label "invasive species"' (2012: 172). As a fundamentally human-centred act, classifying certain species as invasive is a power-laden, inherently controversial, and unstable act with ethical implications (The Multispecies Editing Collective 2017: 5; Robbins 2004: 146; Helmreich 2005). Environmental scientists seem to broadly concur on a definition of 'biological invasion' as the occurrence and proliferation of organisms 'in the wrong place' (Simberloff & Rejmanek 2011), although the temporalities of that process remain heavily debated. Yet allocating an organism in its *right* or *wrong* place, explaining its occurrence, and assessing its impact, remains a highly contested and 'ontologically undetermined' practice across scientific disciplines (Schrader 2010; Ricciardi & Ryan 2018; Berlatsky 2016). Reaching beyond the perimeters of scientific inquiry, the life histories of species that ended up 'out of place' have been captured by an expanding array of categories, such as 'non-native', 'alien', 'exotic', 'colonising', 'pest', 'plague', or 'vermin' (Colautti & MacIsaac 2004; Jeschke et al. 2014; Larson 2010). The overlaps and contradictions between these terms demonstrate how species' naming and the associated moral connotations vary across time, space, and social context, unable to capture the 'flux' that defines lives – invasive or other (Larson 2007).

The critters that roam this special issue are wary of any clear-cut classification. They are widely known and treated as invasive species, yet never in exclusive, straightforward, or universal ways. The labels assigned to them have been changing over time and across space, often with variations

occurring within short periods of time and over short distances. Rabbits for instance demonstrate the inherent instability of categories, moving from being cute to being a threat.

What surfaces in all essays are the tensions between invasion and pest. Invasive species become pests when they are linked to alterations in the environment or threaten to displace native species. Yet pests in some places, can still be sold as luxury items elsewhere: such as crabs for feasting and rabbits or moles for fur. In that capacity, they can set in motion a new commodity chain, for instance when crabs are sent from the Netherlands to China as a delicacy (Devlieger, this issue). The mitten crab, simultaneously a pest in Europe and a luxury in Asia, helps to interrogate the subtle transition through which invasive species may become a pest. Its double life highlights how a species' *pest-ness* does not strictly rely on scientific parameters, but is often a result of cultural perceptions of (in)appropriateness; the reception of the mitten crab in North Western Europe, where it was considered alien-looking to locals, is a case in point. Donna Haraway invokes these ambiguous creatures' capacity to transgress, disrupt, and unmask the compartmentalisation of life as 'monsters' (1999). Like the way cats have been described as an invasive species from the perspective of bird protectors (Zelinger 2017), the description and categorisation of moles, rabbits, fungi, or mitten crabs is an ambiguous, situated process.

Becoming invasive involves a range of negotiations that remain hidden behind neat *objective* classifications and correlations. The accidental, entangled, and ethically perplexing life histories of the protagonists of this special issue blur, shift, and exceed the state, corporate, and scientific categories that lay claim to controlling their invasiveness. The moles, rabbits, crabs, and a fungus thereby unsettle powerful discourses of human mastery. In tracing the (un)making of *invasiveness*, Cattelino argues that '[t]he task, then, is not just to break down or destabilise categories but rather to analyze what sustains them, and with what political and economic effects' (2017: 131). Her call resonates with Mary Douglas' reference to waste (2002 [1966]). Just like 'dirt', invasive species come into being through the conceptualisation and management of an order of things that allows humans to classify non-human life as being 'out of place' (Campkin 2013). Paraphrasing Douglas' interest in waste, invasiveness suggests 'ambiguous and anomalous [qualities], causing anxiety by disrupting classification systems and the 'normal' ordered relations through which one understands the world' (Campkin 2013).

2.2. Distorting infrastructures

The essays compiled in this special issue present exercises in moving away from the split in modern science between *humans* as agents and *nature* as instrumentalisable object. Through a careful engagement with out-of-place crabs, a fungus, rabbits, and moles, the authors expose how invasions constitute, just like extinctions or domestication, multispecies events (Rose, van Dooren & Chrulew 2017).

While humans are central to the material implications of invasive species, the life-stories of these critters do not rely solely on humans. The ways in which species can become invasive hinges on the capacities of species to organise their lives and make their way *out of place*. Throughout that trajectory, they *negotiate* several barriers that allow them to be introduced (by release, escape, contamination, transport, etc), to reproduce, and to spread (Richardson 2020). This perspective raises questions regarding the degree of intentionality read into their trajectories. While it is common sense to assume that these critters are by nature egotistically focusing on their own survival, several authors suggest that their acts are not purely oriented towards survival (Hustak & Myers 2012). Just like humans they build their own projects for their own sake, but they also share a culture, for instance of aesthetic *aspirations* beyond survival that may inform those designs. In many cases, they organise their lives in function or in tune with others, such as parasites, or, as with *P. infestans*, in living as a companion of the potato.

Going even further, a certain awareness of the trouble caused by the presence and proliferation of their own kind may affect behaviours too. Discussing other critters' cultures and aspirations is like walking a tightrope. The field of multispecies studies is often accused precisely for its inability to evade anthropomorphism. However, as Stengers points out, rephrased by Myers, an anthropomorphic approach is not necessarily 'a trap', but can also be a 'lure', one that 'vectorises' research attentions, inspires new questions, and propels inquiry (Stengers 2008: 96, cited in Myers 2015: 7).

What vectorises our research attention, is the role of human-designed infrastructures within the configuration and crisis of a more-than-human Anthropocene. In other words, not humans (as a seemingly homogeneous category) but human designs are central to the life stories of invasive species. This focus enables us to situate processes of invasion and notions of invasiveness in relation to historically and spatially specific projects of imperial, colonial, and capitalist expansion. Crabs and fungi travelled as stowaways on intercontinental shipping lines, whereas rabbits were transported more consciously by settlers. Their translocation was not just a matter of acceleration in a series of accidental encounters (Robbins 2004: 140). While an invasive species might be displaced by a single individual, it is the repeated pattern of mobility, facilitated by infrastructures that transport settlers and commodities, which often allow alien species to become strong enough to 'invade'.

The anthropomorphism read into the trajectories of rabbits, crabs, moles, and fungi helps to understand that becoming invasive is not so much about *what* these species do, but about the fact that what they do partially *exceeds* human control. Aldo Leopold wrote in his *A Sand County Almanac*, 'Just as there is honor among thieves, so there is solidarity and cooperation among plant and animal pests. Where one pest is stopped by natural barriers, another arrives to breach the same wall by a new approach' (1949: 154). Going beyond the common understanding that invasive species start to exist once registered in

regions which 'they would not have reached without human assistance' (Richardson 2020), all contributions to this special issue demonstrate how certain species are capable of becoming invasive thanks to their ability to climb, colonise, and destabilise human infrastructures. In these ways, these species also construct their own infrastructures, and thereby deliberately or accidentally respond to human infrastructures.

These stories illustrate how plantations, canals, or shipping lines, are designed and expanded in an effort to control and solve 'problems', yet in the endeavour have implied or eased the loss of control. The crabs and fungi demonstrate that they are even capable of destroying the very infrastructures that enabled their success. All of the protagonists are 'teachers' in some way.

Human infrastructures have been key to outlining human-centred chronologies and geographies. At the same time, these infrastructures have enabled nonhumans to mess up established orders. Invasive species and pests trouble spatial categories and linear chronologies. While still bounded to seasonality and other temporal logics, infrastructures have aided them in supplanting slow biological processes of co-evolution by superfast and utterly unpredictable rhythms. The life-stories of these species of this issue demonstrate the uneven, non-linear development of a globalised market economy, in which new commercial trends made an end to warrens, allowing rabbits to *infest* Western Europe, or convinced local authorities to import new potato varieties, which would bring a devastating travel companion with them.

All the work this involves remains largely invisible to the human eye until critical levels are reached. For humans, invasive species and pests are known through their effects, as they tend to be very good hiders. Crabs usually remain out of sight in their burrows that are accessible underwater, until they leave the water during mass spring migrations. Only when the breakdown of human infrastructures becomes visible, is a species registered, measured, and monitored as a scientific fact – a constitutive act in the emergence of the Anthropocene. With the mitten crab this happened once its colonies in Europe ruined embankments and drainage systems. The Thames riverbanks even got destabilised because of excessive Chinese mitten crab burrowing (Clark 2011). Accommodating, resisting, and escaping, they continuously undermine human designs and their underlying aspiration of a predictable nature.

2.3. Humans trying to get a grip

Invasive species have become the subject of strategies of detection, eradication, regulation, containment, and reconstruction. The Feral Atlas asks how spread-out populations have been 'incorporated into human programs of invasion, empire, or capital?' (Tsing et al. 2020). As Mougenot and Strivay state in this special issue, 'all means of struggle used against him [the rabbit] were also an opportunity for the settlers to assert their supremacy'. In that sense, the introduction, and later, extermination of invasive species in new lands, count as formative experiences of imperialism and settler-colonialism (Cattelino 2017; Ogden 2021).

Firstly, technological and scientific changes have been central to these repertoires of human response. They played a big part in shaping the 'coming into existence' of certain invasive species. One might ask would *P. infestans* have survived as a species before the mid-19th century had it made its way to Europe in previous centuries? Science, and its applications, is also linked to the development of large infrastructures that facilitated the introduction of new species, as happened particularly with intercontinental shipping.

Secondly, technology and science is translated into 'anti invasive' policies, whose design and implementation has become a global priority (Keller, Cadotte & Sandiford 2015). Efforts to deal with species' capacity to become 'invasive' are largely guided by conventional environmental governance strategies that try to eliminate the species in question from a certain environment. Regional, national, and sometimes supra-national funds are poured into such efforts. Some methods are more interventionist than others, some more 'efficient' than others – and yet still the notion continues to lure scientists and policymakers into ever deeper technoscientific 'simplifications'. Simplifications that flout historical multi-species world-making processes. Moreover, these simplifications, and how they facilitate or prevent other beings from ending up out of place, interfere with, and deepen human inequality. Consequently, the impact and risks humans are exposed to when responding to invasive species is deeply unequal. In the journey of the potato fungus, *P. infestans*, to Europe in the early 19th century, public officials from West-Flanders were able to import new potato varieties from the Andes, relying on their access to the human-built infrastructure for transcontinental transportation, leading to the infestation of potato fields across Europe. On the other side of the Atlantic, potato farmers, and rural societies at large, were extremely vulnerable to the propagation of *P. infestans* (Cottyn, Beeckaert & Bruneel, this issue).

Thirdly, the legitimation of these policies relies crucially on an anti-invasive rhetoric. In a context of intensifying global contacts, invasive species are often framed as problematic foreign influences (Subramaniam 2001), and even as the culprits for large-scale, transformative events (Gobster 2005). In the case of the mitten crab, the reporting on their arrival in Bruges in local newspapers in 1939 had clear racist undertones (Devlieger, this issue).

While usually well-intended, human efforts to get a grip on species invasion are often misguided and can lead to rather contradictory outcomes. As Minteer points out, this misguidance is based on the illusion of an environment under human control, which nurtures a short-sightedness towards complex ecological and ethical dilemmas (2018). As there is no such thing as a pristine environment on earth, Pearce explains, these interventions remain misguided (2016). Moreover, van Dooren (2014) and Chrulew (2011) have argued that efforts to ensure 'species survival' often blur the boundary between care and coercion. When nature has been separated from human activities it tends

to be simplified to a former, or stagnant state of nature in need of 'protection against' human activities and hence from other forms of nature in which humans participate. Eco-systemic services attributed to certain species are a case in point. They reduce life forms to a service (or a nuisance) through commodification (Brockington 2011).

The level of anthropogenic disturbance, degradation, and potentially abandonment is often equated with the quality of a landscape's 'invade-ability' (Robbins 2004: 142). In the case of European potato agriculture, *P. infestans* encountered a monoculture landscape to thrive in. Human efforts to contain the potato plague generated ever more intensively engineered landscapes increasingly integrated in global corporate technoscience networks aimed at bolstering the resilience of the potato.

Not everything is so rigid. When humans are constrained, in certain conditions, they can change their outlook on the species in question. Constrained by budgets for instance when food was rationed in Belgium during WWII, locals recall how they started eating the Chinese mitten crab. Exceptional conditions shifted cultural frameworks that previously restrained people from doing so (Devlieger, this issue).

Where the notion of invasion draws coexisting – native, alien, harmful, productive – species into a hierarchical and morally loaded relation, alternative ethical-political notions are emerging. An orientation towards 'care and belonging' (The Multispecies Editing Collective 2017; Puig de la Bellacasa 2017) or 'conviviality' (Doyon & Vacarro 2019; Büscher & Fletcher 2020) rests on the acceptance of intimate, yet therefore not necessarily harmonious, multispecies world-making (Ogden 2018). Such an approach opens room for unintentionality and multiplicity in imagining more-than-human futures. A far cry from holding invasive species responsible, this shift invokes a relation of care, which is however 'ambivalent and never innocent, insofar as it creates and often depends upon unequal power relations' (The Multispecies Editing Collective 2017: 7). Crucially, this relation is not just a hypothetical proposal but actively created through practices of care, attentive to how categories are cast and uncast, and human-designed infrastructures are destabilised. These recastings and destabilisations are the concern of the essays that follow.

3. Narrating the Anthropocene in the Company of Crabs, Moles, Fungi, and Rabbits

Following the journeys of a set of common critters, the essays in this special issue demonstrate how the Anthropocene cannot be narrated as a solid and unified territory that expands smoothly across the globe. Storytelling with displaced species offers a method to explore the Anthropocene's unfolding 'patchiness' (Tsing, Mathews & Bubandt 2019). It encounters these species in interaction with scientists, rural workers, archaeologists, and other-than-humans, highlighting unlikely connections between previously unrelated ecosystems. These interconnections reach from river systems as similar and yet diverse and distant as the Yangtze and the Scheldt (Belgium), or the potato fields in the Andes and Europe.

Across the essays, this special issue reflects three shared methodological moves in seeking to track the ungraspable. First, the authors argue that telling stories is a method in and of itself, each drawing on storytelling traditions specific to their own disciplines. Secondly, the authors take leave from their own disciplines (architecture, history, and anthropology) in order to follow attentively critter's deceptive voyages. Through archives, field work, scientific and popular literature, the essays develop conversations that take the authors outside their disciplinary practices. In this way, the essays are not only accompanying critters that dwell in human-designed worlds differently but also accompany scientists and other practitioners that know these worlds differently too. Thirdly, images have an important place in this special issue. Each essay draws on photography, drawings, and other visual materials that provide different and active representations. The visuals add to the text in exploring the plasticity of the notion of invasiveness. As an inflection of Haraway's reminder that 'it matters what stories we tell to tell other stories with' (2016), these methodological moves support the contributors' interrogation of *whose* stories we can tell stories with. At the same time, these methodological moves consciously leave open the question of how to go about multispecies storytelling. In that sense, each of the essays brings with it a different perspective and narrative style.

The issue opens with the crab in an explicitly visual way. The exhibition organised in Bruges in 2018 operates as the defining medium of this contribution, supported by a hybrid research methodology. The engagement with the crab and its appearance across continents is partly anthropological, partly historical, but also relies on direct encounters with the species. The project leading to the exhibition and this essay involved for instance fishing Chinese mitten crab out of the Bruges canals and keeping hundreds of them in aquariums for months. Interrogating the approaches of fishermen, marine scientists, and cooks, the opening story addresses some uncomfortable questions on migration, adaptation, and responsibilities.

The piece on the mole follows a very peculiar method that a specific group of archaeologists put into practice. In this sense it is more of a micro narrative that unravels between a lab bench and a grassy patch in Belgium. It dips into popular culture, scientific papers, legal frameworks, and social theory. Within the wider context of disciplinary tropes and preconceptions as well as conservation discourses, the consequence of bringing to the forefront an uncanny collaboration between archaeologists and the debris of moles excavations comes to light. More than simply recounting an interaction, it highlights the lasting and far-reaching effects of these brief encounters. Through the experience of the archaeologists' engagement with moles, the essay unearths new possibilities for inter-species collaboration.

Through a historical lens, the essay on *P. infestans* embarks on a voyage that follows the trail of the potato since the sixteenth century, and of phytopathologists as they brought a new scientific discipline into being. It adopts a long-term and global perspective to interconnect

the situated practices and processes of knowledge production in very specific sites, from Andean to European farmers, from botanists to bioengineers. Exploring new, 'more-than-human' directions in history writing, the narrative gives *P. infestans* agency while not assuming ontological stability. This exercise entailed reading and 'un-reading' developments in scientific explanations and policy responses to reconstruct the fungus' whereabouts before and after its pathological identification in the late nineteenth century.

Hunted for pleasure or out of fear, the rabbit teaches humans – warreners, colonisers, or scientists – to hop over, between and across linear chronologies and geographies. This anthropological essay further explores this instability through John Dewey's pragmatic philosophy. The story of the rabbit is exemplary of how concepts come to life – as Anna L. Tsing writes – with 'sticky stories' and 'weird connections'. This text experiments with the crux of 'transaction' (Dewey 1958 [1929]) by refusing intrinsic and fixed identities and directing a gaze into worlds that are always open, provisional, and reviewable. This stance implies an oscillating relation between the 'knowing subject' and 'known object'. Following traces left by the European rabbit, small, surprising, and ironic details find their way into the puzzle of master narratives. The philosophical virtues of doubt are a given in scientific processes, but the heuristic qualities of humour are scarcely acknowledged, and yet they make way for incongruity as a significant mode of discovery.

The issue closes with an afterword by Anna L. Tsing who reflects on how the essays' protagonists push one to notice the Anthropocene differently. By bringing these critters together, Anna L. Tsing's essay closes the cycle, having brought these critters and their story-telling companions together at the Triennale in Bruges.

By continuing to follow the trajectories of these travel (and story) companions, the timing, place, and justification of the categorisation of their abilities, as either functional or as a disturbance, become far from straightforward. This opens up the question of how to 'un-know' these categories and suspend recent and currently dominant notions of invasive species in order to be able to identify other, pre- or co-existing notions, materialities, and practices (de la Cadena 2019). In that sense, this issue is an invitation to pursue storytelling *with* critters, not with the ambition of harmonising our messy interdependencies, but of breaking the mould of hegemonic conceptualisations of those interdependencies.

Notes

[1] The non-profit association Mendop ("Mens en Dier op papier", or Man and Animal on paper) is an independent archives and documentation centre, studying the versatility of interactions between human beings and animals. See also https://www.facebook.com/mendopvzw or http://mendop.org/.

[2] Research on knotweed is not included in this special issue (for more, see Cahn 2020).

[3] Research on the banana disease is not included in this special issue (for more see Thiers 2019; 2023).

Competing Interests

The authors have no competing interests to declare.

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How to cite this article: Cottyn, H., Devlieger, L., & Cahn, L. (2023). Life Out of Place: Revisiting Species Invasions. Introduction to the Special Issue. *Anthropocenes – Human, Inhuman, Posthuman*, 4(1): 1. DOI: https://doi.org/10.16997/ahip.1433

Submitted: 24 March 2023 **Accepted:** 06 July 2023 **Published:** 11 October 2023

Anthropocenes – Human, Inhuman, Posthuman is a peer-reviewed open access journal published by University of Westminster Press.