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Investigating Stray-Concept and Ticks as a Co-Species

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ABSTRACT

While humanities are today calling for re-evaluation of the anthropocentric worldview and affection towards the non-humans, there crawls a small creature in the forests among other animals that evokes feelings of hatred and disgust in humans. The recent decades have witnessed an environmental change in the increase of tick populations and the expansion of tick-infested areas that is attributed to the continuous warming of our climate. This has led to a heightened awareness of ticks and tick-borne diseases that can be contracted by humans. It has also become evident that we need to learn to live with this pervasive proximity to increasing numbers of ticks, this situation will require new attitudes and adaptations from us that will potentially change our behaviors and routines. The article reports on an on-going artistic research project that investigates relations between ticks and humans from a perspective where artistic research meets with scientific research. It presents a contradicting case, in which a disgust and hatred towards ticks is reflected from an evolutionary co-agency perspective that claims that without our parasites – we, humans, would not be what we are today.

INTRODUCTION

The definition of a *stray* states it to be something that has moved apart from similar things and is not in their expected or intended place (Cambridge Online Dictionary, n.d.). In other words, when considering living beings, a *stray* is someone or something that is not where it should be, often considered homeless or not having a right to a home in their current location. Barbara Creed (2017) has investigated the term *stray* in reference to animals and with a focus on the relationship between humans and animals. She defines a new form of stray, an anthropogenic stray, which is a result of the effects of human actions on nature.

One could state that ticks have entered our land in masses with the intention of permanent residency. Environmental scientists have evidenced an increase in tick populations in recent years

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that has led to increased attention from humans to tick-borne pathogens and the diseases they cause (Beloff & O'Reilly, 2021d; Centers for Disease Control and Prevention, 2019). At the same time as many are calling for a reassessment of our worldview and increased affection towards non-humans – for good reasons – ticks crawl in the forests among other animals and cause feelings of fear and loathing in humans. Typically, humans perceive a tick as an intruder without a right to a home in “our” shared landscape. A tick belongs to the category of invasive species, which is defined, for example, by the City of Helsinki as species which

are not originally part of a habitat and that have been introduced to a habitat by humankind either intentionally or unintentionally. It is often stated that invasive species may cause harm to human health (Ambrose, 2019; City of Helsinki, 2020; United States Department of Agriculture, n.d.).

This article reports on an artistically driven investigation of ticks. This investigation has been an intermittent on-going affair for 2.5–3 years. The initial approach for this investigation, similarly to the call for this journal’s special issue, emphasises learning *with* rather than *about* others and non-humans. This has also



Figure 1. Ticks in the Terrarium, 2021. Photo: Laura Beloff



Figure 2. A questing tick, 2021. Photo: Laura Beloff

been stated as the author's attempt from the beginning of this investigation on/with ticks; but how does one measure success in this and what does (learning) *with* actually mean in this context? The paper leaves this important question open and focuses primarily on reporting about the insights gained on ticks from the sciences and the arts. What has become utterly clear during this period is that our, often involuntary, connection to this organism is multi-layered. A tick is an important part of a complex ecosystem. A tick is a vector. A tick is an ectoparasite. A tick belongs to the *Arachnida* class along with spiders. There are many different species of ticks on the planet – in Finland we have primarily two species. A tick eats three times during its life. A tick is blind. A tick carries numerous pathogens. An urban tick lives in the city. A tick has impacted our evolution. A tick is today feared by humans.

A TICK BELONGS TO THE ARACHNIDA CLASS ALONG WITH SPIDERS

Inside my apartment hangs a glass cylinder, which is about 90 cm high and 30 cm in diameter. The glass cylinder has some earth, some dead leaves, cones and other environmental matter. In between these, green long grass grows to the full length of the cylinder. This is an art artefact, a Tick Garden, that has been built during the project dealing with ticks. It is exhibited in an art context, but what it really is - it is a continuation of our traditional display practices of animals in zoos, in natural history museums, in cabinets of curiosities, and as taxidermy objects in aquariums and terrariums like in this case. This Tick Garden experiment is necessary for my desire to observe the survival and behaviour of ticks in their habitat. In

the glass cylinder are around 30–40 ticks of different sizes and at different stages of their life. It is impossible to tell how many of them are still alive after several months of living in their habitat. In the early summer, one could observe them sitting and waiting on the highest points of the grass stalks or walking on the glass surface of the cylinder. In the mid- and late summer there has been less visible activity.

Researcher Tuomas Aivelo points out the use of concepts such as companion animals versus synanthropic animals; the first term referencing pets and domesticated animals and the second one is typically used in reference to wildlife species that live close to humans and benefit from this relationship. However, Aivelo finds it interesting to play with these terms and sometimes refers to synanthropic wildlife as companion species and in this way bring forth diverse relationships we have with different non-humans (Beloff & O'Reilly, 2021b).

One can say that it seems that classification is a way in which we try to make sense of the world, including the natural environment and our experiences. Scholar Harriet Ritvo (1992) points out that “the terms in which a culture chooses to analyse the world may reveal as much about that culture as about the external reality they ostensibly describe” (p. 363). According to Ritvo, for example, the opposition between the wild and the tame, or domesticated can function as the first stage of discrimination in natural taxonomy. She continues: “a system of classification based primarily on the distinction between wildness and domestication is a system that accords the highest significance to the degree to which a given plant or animal has fallen under human influence and has been incorporated into human civilization” (p. 363).

A companion animal is a complex term and quite often used in parallel to a *pet*. Therefore, there are on-going debates in the field of animal ethics that aim at clarifying these terms, their differences and use (Palmer, 2015). It seems that the term companion animal is more respectful than the term pet.

While the term pet references ownership, companion animal implies that there is a mutually beneficial interaction between the species. To consider these ticks living in an apartment as close companion species is to share space and air with them and to make sure that their habitat stays moist. The benefit is the possibility to observe their life in close distance. The benefit for the ticks is the maintenance of a suitable habitat and a large enough population

to find a mating partner. But there are also negative sides, such as that the ticks are not free in nature, which limits their possibilities for finding a host for their next meal. This points to another debate in animal ethics that concerns whether creating animals to be human companions or dependent on humans is wrong in principle (Palmer, 2015).

A TICK EATS THREE TIMES DURING ITS LIFE. A TICK IS BLIND

Excerpt from Sellbach and Loo's text about a tick titled *The Blind & Deaf Highway Woman*.

USHER 1:

How is a tick a machine operator?

USHER 2:

A tick, after mating, climbs up a shrub. Deaf and “eyeless”, she is drawn by her photosensitive skin, and hangs on the tip of a twig, waiting for a mammal to pass beneath her.

[*USHERS 1 & 2 are silent for a few minutes*]

USHER 1:

Over this period, which may be almost her entire life span, nothing affects her.

The USHERS wait silently for a longer period still. Some in the Audience shift about in their seats.

USHER 2:

The tick, smelling butyric acid, which is a chemical emitted by all mammals in their sweat, falls.

USHER 1:

Oh no!

(Sellbach & Loo, 2018, p. 124)

An intriguing factor of a tick's life is its contradicting phases. It is partly very stationary – sitting on a grass stalk onto which it has laboriously crawled – waiting and waiting for “a random ride”, which is the only opportunity to proceed with the expectations set for its life, as referenced in the excerpt above. The contradicting phase in the tick's life is that when a ride (possibly and finally) appears and the tick successfully catches it, it might take the tick on a flight of 1000 km or even to another continent on the back of a migrating bird. The research has evidenced that comparable gene pools of ticks are very widely spread, which points to occasional long-distance travelling (Araya-Anchetta et al., 2015). However, quite



Figure 3. The Tick Terrarium 2019 version and the Tick Terrarium 2020 version. Photos: Laura Beloff

commonly a ride for a tick is a deer, a dog or another mammal that lives in its vicinity, with shorter distances involved.

According to Aivelo (2018), the successful life of a tick is based on the following measures:

it must bite at least three different animal individuals during its lifespan. The tick larva hatched from the egg seeks a grass stalk, a leaf or other place where it can catch a ride with its host. When, or mostly if, the larva finds a suitable host, it enjoys a blood meal and afterwards drops to the ground to develop into a nymph. The nymph, in turn, needs a blood meal to develop into an adult. And finally, adult females need a blood meal to lay eggs. (p.195, translation by the author)

When and if a tick attaches itself to a human host, this can be seen as the “dead-end” for the tick. This is due to the fact that the human host will most likely find the attached tick, and at that moment, the tick’s life ends.

Johannes walks ahead of Jasmin and drags a white cloth behind him on the island of

Seili, Finland. The heavy cotton cloth is 1 m x 1 m in size, it is attached to a wooden stick that functions as a handle. After about 10 meters of dragging the cloth on the ground, Johannes stops and cautiously turns the cloth around. Two heads bend over, sharp tweezers in their hands Johannes and Jasmin begin counting and collecting ticks from the cloth for research purposes in Turku University. “The cloth simulates a passing host and actively host-seeking ticks attach to it. White cloths are typically used in such collections, as the detection of ticks is easiest from these” (Sormunen 2018, p.20).

To collect ticks, I am imitating the practice of scientists: I have a 1m x 1m white cloth attached to a wooden handle. I am dragging it on the ground behind me, not systematically on a defined track like the scientists when they collect ticks and make observations on population numbers. My focus is primarily on finding and collecting. I am fully dressed in white and I keep checking my trousers for moving dark spots.



Figure 4. Tick Garden / Punkki Puutarha 2021. Photo: Laura Beloff

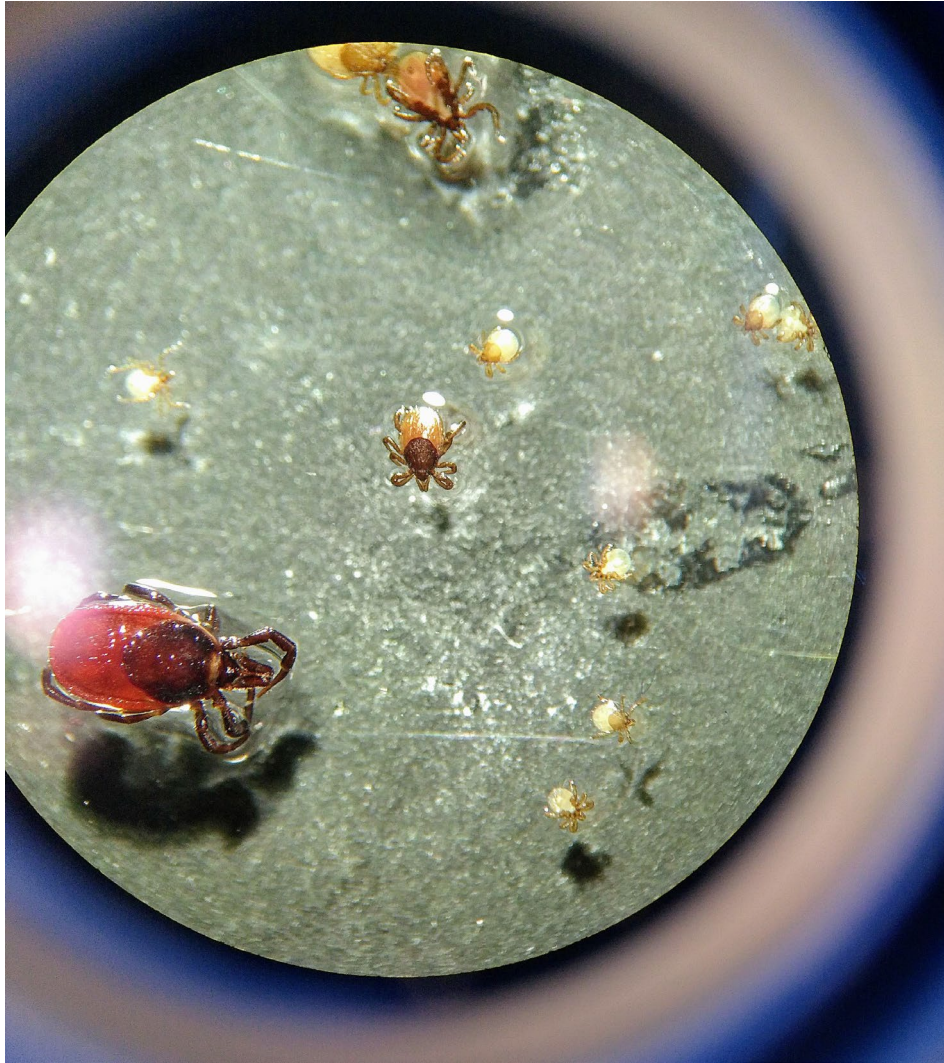


Figure 5. Ticks through a microscope. Photo: Laura Beloff

A TICK IS A VECTOR

This means that ticks horizontally transfer pathogens from one host to another. For example, a tick may catch *Borrelia burgdorferi* bacteria along with other pathogens from a hare, and if it bites a human for its next meal, it commonly transfers the *Borrelia* bacteria to the human, in which it may cause Lyme disease if not treated with antibiotics.

Before the 1970s there was no awareness of ticks being a vector and that the various pathogens, which ticks carry can be harmful for humans or other mammals. This connection to pathogens was not made at the time (Beloff & O'Reilly, 2021a). Lyme disease was discovered in the mid-1970s and named after the city of Lyme in Connecticut, US, where there were many cases and active patient advocates who begun taking notice and conducting their

own research on this mysterious disease with severe symptoms (Bay Area Lyme Foundation, n.d.). A Finland-focused study indicates that Lyme Borreliosis level measured in blood serum (seroprevalence) was considerably higher in Finland in the late 1960s and early 1970s than in 2011, with a difference between 3.9% and 20% (Cuellar et al., 2020). This surprising result shows that more people had traces of *Borrelia* bacteria in their blood in the past than is diagnosed today. This shows that the existence of ticks and the *Borrelia* bacteria they occasionally carry is not at all a new situation in Finland, although popular media often make us believe so. However, there has been a clear, evidenced increase during recent years in tick populations of diseases caused by tick-related pathogens and their distribution areas in Finland and globally. This is considered to be impacted by currently occurring climate and other

environmental changes (Aivelo 2018; Centers for Disease Control and Prevention, 2019).

A TICK HAS IMPACTED OUR EVOLUTION. A TICK IS TODAY FEARED BY HUMANS

It is somehow revealing to think how deeply we are connected to our environment, including parasites, and how these organisms have impacted human evolution. It is gradually becoming obvious to me that humans would not be what we are today without the impact of parasites.

Investigating the past evolutionary trajectory of humans Aivelo (2018) writes:

Whilst there was plenty of plant-based food in Africa throughout the year, in the harsher conditions in Europe, they only had hunted meat on which to live during the winter. Meat, in turn, predisposes more to parasites, and therefore Neanderthals probably had a more effective immune defence than our own ancestors. [...] By moving to the Neanderthals' habitat and consuming the same diet, modern humans also inherited the Neanderthals' parasites. Neanderthals became extinct, but still

their genes helped modern humans to adapt to the new environment in this most intimate of ways. [...] We have inherited from Neanderthals not only their parasites, but also their immune genes. While these genes were beneficial to modern humans as they spread around the world, now that there are no longer so many parasites in our environment, they have become harmful. (p.284, translation by the author).

The Tick Terrarium is a device made of glass and designed to be worn on a human. The work ironically creates a situation in which the wearer (or viewer) of the Tick Terrarium is directed towards an emerging question: Which is more threatening, the broken glass on one's body or the free-running ticks?

The Tick Terrarium is also an attempt to build a small-scale habitat for the ticks which is supported by the wearer's body heat (sensed by ticks). The Tick Terrarium has openings for oxygen and for watering the habitat environment. The several glass compartments are connected with plastic tubes to provide access for ticks to move from one compartment to another. However, until now there have been no sign that this feature would be used by ticks. The wearable design of the Tick Terrarium



Figure 6. Field work with scientists 2019; Seili island. Photo: Laura Beloff



Figure 7. Collecting ticks 2019; Seili island. Photo: Laura Beloff

references our interminable close connection to our parasites, such as ticks – even when we might feel fear and disgust towards them. The shape of the *Tick Terrarium 2020* is made with a reference to a suicide bomber’s vest. This additionally points to past research (1950s–70s) in the US which focused on investigating possibilities for using ticks as a bioweapon, written about in a popular-science book titled *Bitten* (Newby, 2019).

A TICK IS A STRAY?

A tick researcher Jani Sormunen claims that because we are aware today that ticks are more dangerous to us than we previously thought, this may be the reason why people find them disgusting. However, he also admits that it is difficult for him to claim this, as he does not find ticks disgusting. Sormunen has developed a different relationship with his research subject, which is not coloured with fear or disgust (Beloff & O’Reilly, 2021a). Sormunen’s attitude towards ticks evidence that the more familiar we are with other living entities the more empathy and acceptance we can feel for them.

However, without doubt, disgust is one of the words that come easily to mind when talking about ticks. Barbara Creed writes about the relation between Julia Kristeva’s term *abject* and the concept of the *stray*. According to Creed, “human society defines abject those things or states of being, such as straying, that threaten the identity of the whole and proper subject, as well as integrity of society” (Creed, 2017, p. 21). Like mentioned at the beginning of the article, humans easily perceive a tick as an intruder, a stray animal, without a right to a home in ‘our’ landscape. Creed points out that one characteristic of Kristeva’s abject concept is that it does not respect borders. This Creed further connects to refugees as stray in the Anthropocene; displaced people (refugees, asylum seekers, climate refugees) have globally exceeded 50 million for the first time since World War II. This number only reflects humans, but similarly, various animal species, including ticks, are on the move in search for a new home and suitable habitat.

The concept of the stray applies to humans and animals who have drifted from their normal path or been rejected or abjected because of their nature, situation, status or species – according to Creed (Creed, 2017). A tick is a stray: unwanted, a nuisance, an invasive species and harmful for human health. It seems that we

(humans) have no use for a tick, although on the contrary we can offer a blood meal for a tick’s survival.

This project and my ponderings have led me to the pressing question concerning the ticks living in the glass cylinder in my apartment: How can I feed them?

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