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## **Living Biotechnical Lives**

*noise, parasites, and relational practices*

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## ARTICLE

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# Living biotechnical lives: noise, parasites, and relational practices

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**Abstract**

Life in the era of biotechnology opens up opportunities but also poses challenges related to our values and questions regarding the way we want to see coexistence on our planet, which is inhabited by many species.

The parasite is our case study and an interesting concept that we inherit from biology but which is also addressed in humanism and philosophy. As humans, we commonly understand the concept of a parasite as a negative one that suggests someone or something which benefits at our expense. However, French philosopher Michel Serres had a different view of the parasite. According to him, the parasite is based on relationships between different entities, and there is often noise in these relationships. Serres refers to biologist Henri Atlan, who has argued that said noise forces the system to reorganize itself in a way that incorporates the noise into the complex system. The idea of noise

as an integrated part of the system is quite far from today's thought processes with the development of bio/technology that typically aims to be noiseless and error-free and have aesthetically attractive results.

Therefore, although parasites are often associated with terms such as inhospitable, undesirable, and disgusting and are seen to be located outside of art and technology, in this paper, we argue that the concept of something parasitical is tightly inter-twined with our contemporary biotechnical lives. The article relates Serres' parasitic thinking to an artistic mediation of the biological parasite: the tick.

### Keywords

parasite; Serres; biology; technology; noise; ticks; relations; biotechnology; science; evolution

### *Vivir vidas biotécnicas: ruido, parásitos y prácticas relacionales*

#### Resumen

*La vida en la era de la biotecnología brinda oportunidades, pero también plantea desafíos relacionados con nuestros valores y preguntas sobre cómo queremos ver la coexistencia en nuestro planeta habitado por muchas especies.*

*El parásito es nuestro estudio de caso y un concepto interesante que heredamos de la biología, pero que también se aborda en el humanismo y la filosofía. Como seres humanos, entendemos normalmente un parásito como un concepto negativo que sugiere que alguien o algo se beneficia a nuestra costa. Sin embargo, el filósofo francés Michel Serres tiene una noción distinta sobre el parásito. Según él, el parásito se basa en relaciones entre entidades diferentes en las que a menudo hay ruido. Michel Serres hace referencia al biólogo Henri Atlan, que ha argumentado que el ruido obliga al sistema a reorganizarse de una manera que incorpora el ruido como parte de ese sistema complejo. Con el desarrollo de biotecnología, la idea del ruido como parte del sistema queda bastante lejos de los razonamientos actuales, ya que esta habitualmente tiene como objetivo obtener resultados libres de ruido, sin errores y estéticamente atractivos.*

*Por lo tanto, aunque los parásitos a menudo se asocian con términos tales como inhóspito, indeseable y desagradable, y se considera que están ubicados fuera del arte y la tecnología, en este artículo, argumentamos que el concepto parasitario está estrechamente entrelazado en nuestras vidas biotécnicas contemporáneas. El artículo relaciona el pensamiento parasitario de Michel Serres con una mediación artística del parásito biológico, una garrapata.*

#### Palabras clave

*parásito; Serres; biología; tecnología; ruido; garrapatas; relaciones; biotecnología; ciencia; evolución*

## Introduction

Scholar and ecofeminist Vandana Shiva proposes in a published interview that the reductionist approach, typically present in the sciences, symbolizes violence at a mental level. This violence begins with the way we are brought up and how we learn how to think about the world. According to Shiva, “the connection between reduction and science, its violence, the technology that it shapes, and a profit centre of capitalist structure of limitless resource exploitation is all connected because when you declare that nature is dead, then you exploit her” (Jahangirloo 2013, 46). With this in mind, it is certainly interesting to investigate what we commonly regard as the darker aspects of biology, such as parasites: organisms that we consider unpleasant, and which might

be harmful to our health. A similar darkness can also be seen in our practices with biotechnology when manipulating diverse organisms' faculties, abilities, and evolutionary trajectories. One should acknowledge that there are numerous beneficial developments in biotechnology, but that these were developed primarily to benefit humans. In other words, from a human perspective, not all of these developments are 'dark', but this is obviously a matter of perspective.

This article is not specifically a critique of technoscience nor of its development, but in what follows, we will conduct practice-based readings of the French Philosopher Michel Serres' book *The Parasite* (Serres 1982) in an attempt to formulate a non-reductionist position which includes reflections on noisy evolution, parasites and practices relating to the biotechnological lives we are leading.

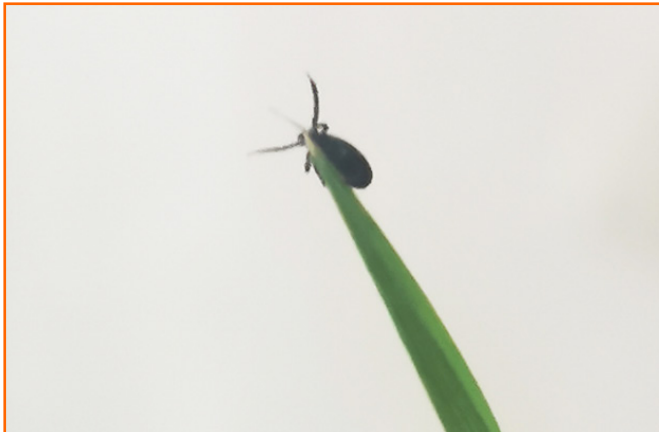


Figure 1. Questing tick  
Source: ©Laura Beloff 2021

## 1. Parasites

Stephen Crocker reminds us (in referring to Serres' book in his paper on 'noise') that the term parasite in French refers to three very different things, albeit sharing the common principle of interference (Stephen Crocker 2007, 14). As Crocker points out, in Serres' text the term 'parasite' may refer to a biological organism that lives off a host, a social organism who feeds on the charity of others without giving anything in return, or static/white noise in a communication circuit.

Arguably, one of the major post-humanities perspectives on the concept of parasite (and its relation to the human world) was written by Serres (Williams 2020, 1). Serres argues that *The Parasite* challenges the very idea of the humanist subject. For instance, the interdependency of humans with their environment is blurred by ideas about *autonomy* and *agency* (to name but a few to which Serres refers in his book). Furthermore, and pertinent to our argument in this article, Serres is experimenting with his style of writing, the structure of which is largely based on intertextual references. His aim is to establish a new format of critical post-humanistic writing, freed from academic conventions such as method and dualistic definitions. This new format, shown in his highly experimental writing style in *The Parasite*, uses poetic figurations and tropes, weaved into parables and other meta-poetic formats. Indeed, the "parasite" is one such figuration, trope or motif serving the reformatting of humanistic thinking for which Serres aims.

Serres proposes that the parasite is key to evolution and our relation to our surrounding world. The parasite, he argues, can lead us to an image of our world in which relations are enabling further mutation and 'parasitism'.

"We parasite each other and live amidst parasites. Which is more or less a way of saying that they constitute our environment." (Serres 1982, 14)

In summary, Serres' book is about the role of the parasite in social, biological, and informational systems. Serres suggests that the parasite is ubiquitous in any system and furthermore, importantly, it serves as what he terms a "thermal exciter": it may bring about or provoke change to the very constitution of a system (and, in effect, to the whole 'system of existence', which according to Serres is the entire network of human-environment relations).

### Who is host and who is parasite?

The radical implication of this question is that the notion of the parasite is not necessarily a negative one – as we commonly conceptualize it today – and that it opens up a new range of possibilities because it interconnects social, biological, and informational systems. For example, minority groups who are commonly deemed "parasitic" from societal perspectives can make "pests" of themselves in order to bring about social, political, and other forms of change.

The parasite leads us to relations otherwise invisible or inaudible to us. Serres sees the parasite as a biotechnical parable that may reveal how human relations and non-human relations are interwoven. (Søndergaard 1995, 8)

In other words: there is an inter-relationship between the biological and social, and the technological; that is, "parasite" is always already a biosocial idea, in many ways (in)forming how we live our biotechnical lives.



Figure 2. Ticks in the *Tick Terrarium* (2020)  
Source: ©Laura Beloff

## 2. Biological parasites

One example of a biological parasite, the tick, is the focus of an artistic research project by Laura Beloff (originally initiated and partly conducted in collaboration with Kira O'Reilly under the title #tickact). The biological, social, and communicative circuits raise questions about parasitical relationships in humans' evolutionary trajectory, biological organisms, technology, and art. In this article, the tick is used as a case study from biology (in addition to being the focus of the aforementioned art project) representing a world of transforming relations. This artistic investigation focuses on the complexities of a relations between ticks and humans sharing a habitat.

The tick is an arachnid and a member of the arthropod group together with spiders and mites. Today, we encounter increasing number of ticks in our environment: in nature, but also in the borders of urban parks. Ticks are becoming one of the most frequent parasitic guests in our lives.

From an environmental science perspective, ticks are considered *vectors* – this means that they carry pathogens, bacteria, and viruses, which they transfer from one host to another. Some of these pathogens can cause serious diseases in humans, such as Lyme disease: the result of the spread of the *Borrelia burgdorferi* bacteria to humans. This aspect of being a transmitter renders the tick a feared and unwanted visitor in our lives. But one can also see that as a vector, a tick creates horizontal connections, or relationships, between the various hosts that the tick uses for its necessary meal of blood. This meal is what we humans can offer the tick, though this is an involuntary act on our part.

In our minds, the parasite is a feared concept referring to someone or something which benefits at our expense, which does not easily mesh with the individualistic mindset which we have been brought up. This mindset can be seen as the result of growing up in a culture that favours the paradigm of commercial interests and individualism over that of local communities, to follow V. Shiva's definition of the two paradigms of biodiversity (Jahanbegloo 2013, 54).

## 3. Noise

Noise is defined by an online dictionary in relation to technology, for example as an unwanted signal or disturbance in an electronic device or irrelevant data occurring alongside desired information.

Serres perceives the parasite and parasitic relation, interestingly, through the concept of noise. His re-evaluation of 'parasitic' noise builds on a basic principle of information theory by Claude Shannon. In Shannon's pioneering work in which he laid the foundations of information theory, he was researching an efficient way of encod-

ing information and dealing with the problem of noise. Shannon understood noise as elements of the signal that are not part of the actual message being transmitted (Søndergaard 1995, 8; Gere 2006, 30; Beloff 2012, 54). In Shannon's work, noise is recognized as a necessary consequence of transmission. He was researching noise in relation to communication systems and observed that unwanted and disruptive noise became symbolic of the struggle to control the growth of systems. The more complex the system, the more noise needed to be addressed. In his work, Serres compares noise to parasitism with the example of a city rat by proposing the following – "Theorem: noise gives rise to a new system, an order that is more complex than the simple chain. This parasite interrupts at first glance, consolidates when you look again. The city rat gets used to it, is vaccinated, becomes immune. The town makes noise, but the noise makes the town" (Serres 1982, 14). Noise becomes an integral part of the system.

When noise appears in everyday technology-based media, such as static in a radio transmission, the presence of the medium is registered in what would, seemingly, otherwise be a clear transmission. As Stephen Crocker explains, Shannon recognized that whether a certain effect is considered noise depends on one's position in the listening chain. Noise is interference only from the sender's point of view. From the point of view of the receiver, it may be considered a part of the information packet that is transmitted along a channel (Crocker 2007, 5).

According to Serres, noise does not indicate a fault, mistake, or information gap; rather, it indicates a surplus of information. To continue in the consideration of noise from a perspective that sees it as an integral part of the system, there have been claims, for example in media theory, which have investigated the impacts of technology on us (humans). For example, Marshall McLuhan famously argued that "the medium is the message", which means that the user becomes the content of the message (Crocker 2007, 5). More recently, scholar Benjamin Bratton has highlighted proto-sentience and surfaces in urban environments. He writes that technology and clothing form a type of artificial skin for us, but also that the city's surfaces have begun sensing the environment. According to him "the city also wears us" (Bratton 2021). We have become an essential part of the system. It becomes clear that a medium/milieu affects, or acts upon, the signal. The active intention to transmit a signal requires us to open ourselves to the passive reception of the medium in which it can occur. A critical viewpoint into this type of technological development had already been pointed out in the early 1970s by art historian Jack Burnham, who described the role of artists within the evolving technological milieu: "With increasing aggressiveness, one of the artist's functions, I believe, is to specify how technology uses us" (Burnham 1974, 38). This has become increasingly evident in today's bio/technology developments.

## 4. Relational practices

Serres transposes the parasite to something which should be understood as a critique of traditional academic modes of knowing and especially of the self-understanding of academic writing and ‘science’ (including ‘methods’ in the humanities and the arts). This can be thought of in relation to technology – that technology is already there as a part of the relationality of practices. According to Serres, there is no intentional congruence between technology and culture, but there is a relationality of practices, causes, and effects of what is done, while and after it is done.

Serres introduces the parable of the ‘productive force’. He follows French biologist Henri Atlan, who argues that noise prompts a system to reorganize itself into a more complex form that incorporates the disturbance (Crocker 2007, 5; Atlan 1974, 295-304). Here, we really find the crux of Serres’ theory of the parasite.

“In each case, the parasite interferes in, and ultimately upsets, some existing set of relations and pattern of movement. It compels us either to expel it, or to readjust our internal workings so that we can accommodate the needs of the parasite. Noise, in other words, is to communication what a virus is to an organism, or a scapegoat is to a community. It is not simply an obstacle, but rather a productive force around the exclusion of which the system is organized.” (Serres 1982, 569)

The parasite acts on existing communication, be it biological, informational, or social. It instates itself in the circuit at a point between transmission and reception. The parasite does not act directly on either the sender or the receiver. It acts on the relation that joins, for example, an enzyme and the protein it breaks down, or a tick performs the relationship between different hosts by being the vector for trespassing bacteria or viruses. Serres defines, quite precisely, that the parasite always acts on relations. Typical of his experimental style, he writes that while atoms lead us to (a dualistic) ontology, the parasite leads us to (biosocial) relations. (Serres 1982, 570) One can also say that the parasite forms new biosocial relations as a vector between different entities.

The property of the parasite of joining diverse entities enables new constellations and human thought processes, which are based on relational practices and which inherently include noise as a component.

The formed network of diverse relations and general interests in the contemporary feared parasite, the tick, form the backdrop for the work *Tick Terrarium* (2020) by Beloff. The artifact, the *Tick Terrarium* (2020), is a wearable device for humans, made of several glass vessels. Inside the vessels are habitats for living ticks, made using grass, moss, and natural rubbish. This wearable device resembles a suicide bomber’s vest in its shape, but rather than explosives, the wearer carries fragile glass vessels with parasites living inside them. The work directly references, through its shape and wearability, the biotechnology research and development into ticks that was conducted in the US between the 1950s and the 1970s with the aim of using ticks as bioweapons

– something described in depth in the popular science book by Kris Newby (Newby 2019). The *Tick Terrarium* ironically asks which is more threatening to our bodies: glass shards, or free-roaming ticks?

Another intriguing example of using parasites for human purposes, but which also presented a small risk to human health, is a study that focused on the development of a typhus vaccine. The research began in the 1920s, conducted by Austrian parasitologist Rudolf Weigl. The parasites in questions were lice which fed on human blood.



Figure 3. *Tick Terrarium* (2020); a wearable bioweapon

Source: ©Laura Beloff

The bacteria *Rickettsia prowazekii* had been identified as the cause of typhus fever, and its spread had been located in lice. The propagation of typhus fever required lice to act as a vector, in a similar way that a tick is a vector for other diseases. The lice must first feed on an infected human, then feed on and transmit the bacteria to another human, who would then also be infected with typhus fever.

As lice need to feed on blood, preferably human, Weigl invented a novel technique of feeding lice with human blood. This involved attaching special cages on the human's body through which the lice could suck blood. After this, lice were injected with *Rickettsia prowazekii* bacteria. The intestines of the injected lice provided the first basis for the typhus vaccine development (Abryszeński 2019). When the Second World War broke out, Weigl's research was put in use by the Nazis as the vaccine was needed in increasing quantities for the occupying armies. Weigl's laboratory in Poland was extended and many so-called louse-feeders were hired, who wore the lice cages on their thighs. Louse-feeding became a sought-after occupation despite the risk of being bitten by lice that may have been carrying the bacteria. Weigl hired many Jews as louse-feeders, as well as his laboratory assistants; in his laboratory, the feeding of these human parasites became a cover for his underground operations (Allen 2014).



Figure 4. Tick Garden experiment (2021); an artificial habitat for ticks

Source: ©Laura Beloff

## 5. Noisy relations

Serres sees the parasite as a key to evolution, and a similar interpretation is also advocated for by contemporary evolutionary biologists. Scientist Tuomas Aivelo writes the following about human evolution and inherited parasites in our long history: “Whilst there was plenty of plant-based food in Africa throughout the year, in the harsher conditions in Europe, they [Neanderthals] only 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 Neanderthalian 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 the 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 many parasites in our environment, they have become harmful” (Aivelo 2018, 283-284). With this, Aivelo asserts that we (humans) would not have evolved into what we are today had there not been parasites and parasitic relations involved. Parasites affect us on many levels: our physical health, but also our behaviours and attitudes. In a sense, one might think of parasites as a kind of noise in the system that challenges and potentially reorganizes our minds and bodies, as well as forcing us to cope with old and new relationships and unexpected noise in them.

The notion of the performativity of facts is useful in approaching artistic activity with ticks. Such practices in the arts and sciences are comparable to experiments carried out by practitioners who, according to Isabelle Stengers, raise the question of how to ‘struggle against the role as-signed to their practice’. She goes on to connect experimental (scientific) practices to an existential struggle against the growing exposure of practitioners to a destructive pattern of a dominating neo-rationalist umbrella culture that cancels out any noisy images (and thereby the identity of the experimental practitioner as well) generated by experimental practices:

“Under the guise of the (capitalist) ‘knowledge economy’, what is happening is no longer only the intoxication but the destruction of the social fabric which empowers researchers to think and feel, imagine and object. Soon those practices will indeed confirm the critical diagnosis that there was never anything special about them, that they were reducible to power interests. How to connect with those scientists who complain about their increasing subjection?” (Stengers 2008, 38-59)

One could claim that many experimental practitioners in the arts working with technology and biology create new kinds of noisy images, which are in a way parasitical of the conventional scientific understanding of nature and humans’ perception of it.

An example of a noisy image is artist Paul Vanouse’s work *Labor* (2019), which can be viewed as an experiment with biotechnological

methods on the hidden lifeforms existing in our bodies and exiting through our skin when we sweat. Vanouse shows that microbes vastly outnumber the human cells in and on the body, concluding that: “Our microbiota is integral to who and what we are and complicates any simplistic sense of self. Likewise, the smell of the perspiring body is not just a human scent, unless we are willing to redefine what we mean by human” (Vanouse 2021). It is interesting to consider microbes and parasites from a same perspective, even knowing, as we do today, that our bodily microbes are largely beneficial to us and that they constitute an integral part of our body. These invisible microbes are in a symbiotic, not parasitic, relationship with us. That said, the tick, along with other parasites, is seen as an intruder or external force that often has a negative impact on us.

## 6. Biotechnical lives and noisy evolution

Vandana Shiva says about (reductionist) science that “it assumes that only things that can be measured exist. You cannot measure a relationship; a relationship can only be experienced” (Jahanbegloo 2013, 67).

The dominating rational scientific culture seems to shy away from the parasite outside its micro-biological *habitat*, and from everything noisy when concerning the idea and boundaries of what is human and what is not. Similarly, one can critically ask upon what criteria we base our choices when, for example, we modify organisms or decide which non-humans are accepted and which are not. Parasites would presumably belong to the latter group. The criteria-in-use appear to be influenced by the prevailing technoscientific perspectives and the expected use value for humans. The decisions made, their embedded values, and connected aesthetics are also visibly trickling down to art practices. For example, one could say that in digital and biotechnological arts, certain types of aesthetics are dominating, typically described as aiming for cleanliness, smoothness and perfection. This is an obvious influence of technological development and biotechnological practices, which push for better, more efficient systems and idealize continuous progress, often with the expectation of profit. These kinds of approaches and aesthetics can be seen regularly, for example in various experiments in the field of biological engineering and biodesign developments, with its various competitions (such as Biodesignchallenge.org).

It seems that the mainstream technological mediation (as well as development, such as in synthetic biology) favours a perfect version of the world, editing out the bad, the ugly, and the unpleasant, such as parasites, noise, and errors.

In the case of the tick project and the work *Tick Terrarium* (2020), as well as the work *Tick Garden experiment*, the opposite is true; these parasites are brought into our vicinity in order to critically challenge the

limits of our anthropocentric worldview and affection towards non-humans. It is hard to deny that ticks would not evoke, on some level, feelings of hatred and disgust in us. But how can we go further from this beyond the desire for perfection and for control over life?



Figure 5. *Tick Terrarium* (2019 and 2020)

Source: ©Laura Beloff

## Conclusion

We began by stating that this article is not a critique of technoscience: rather, it is an attempt to mobilize Serres' parable of the Parasite in perceiving some artistic practices as 'thermal exciters', interrelating and changing bio-, -social and informational systems. Also, this article ponders opportunities to view parasites in a more positive way than usual, as well as to see their role as a relational organism that has and is continuously impacting and forming our (human) evolutionary trajectory.

Through a practice-based reading of Michel Serres' text *The Parasite*, we have investigated the noisy evolution, parasites, and practices relating to what now appears to be a struggle against *ourselves* and *the social*, as well as *scientific*, norms we so keenly construct. Increasingly, scientific culture and practitioners in a range of fields have been subjected to growing expectations of cancelling out noise and parasites. These might be the darker sides of the bio-technological lives we are leading – and which we ought to be questioning.

In this paper, we underline the importance of Serres' ideas about the parasite as the key player in the noisy evolution of the invisible relational practices that structure the way we live our contemporary biotechnical lives.



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## CV

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Morten Søndergaard (PhD) is an internationally active curator and researcher in the histories, theories, and cultures of transdisciplinary practices merging technology, media, art, and societal trajectories. From a master thesis on the method of Michel Serres in-between poetry, art, and sci-ence (1995) to the PhD on unheard avantgardes in Denmark “Punctures in the Periphery: Show-Bix and the Me-dia Conscious Practice of Per Højholt” (2007) the line of inquiry draws the analysis of transdisciplinary practices into epistemological questions regarding the complexities of human and non-human relationships, as well as a general study of the overarching question regarding experiencing and evidencing post-humanity. He is Associate Professor and Academic Director of the Erasmus Media Art Cultures Master Program at Aalborg University, Denmark.

**Laura Beloff**

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Laura Beloff (PhD) is an internationally acclaimed artist and researcher in the cross section of art, technology, and science. Her research comes in the form of installations, wearable artifacts, and experiments with scientific methods that deal with the merging of technological and biological matter. This research engages with human enhancement, biosemiotics, AI, AL, robotics affiliated with art, humans, the natural environment, and society. She is Associate Professor and Head of Doctoral Education in the Department of Art & Media at Aalto University, Finland.

